PLASTICS & MOLDED PRODUCTS

Reg. U. S. Pat. Off.

Volume 6 **OCTOBER 1930** **Number 10**

Contents

WHAT COST DUPLICATION? 561
By John G. Rossiter

WHERE CUSTOM MOLDERS ARE GOING TO GET NEW BUSINESS 562
By H S. Spencer

THE "BIG FIVE" ON MOLDED TRADE EXTENSION 564

WHAT IS PATENTABLE IN PLASTICS 566
By Charles W. Rivise

PLASTICS AND FOOD AND FOUNTAINS 568
By Zaida A. Ellis

OBSERVATIONS AS TO THE FORMATION OF SYNTHETIC RESINS 570
By R. H. Kienle

THE WORLD'S RECENT PROGRESS IN SYNTHETIC RESINS 577
By Dr. Aladin

ITALIAN PLASTIC PRODUCTION AND TRADE 587
By Elizabeth Humes

RESINOIDS IN THE PRINTING ARTS 593
By Charles W. Rivise

TRAVEL IS SAFE WITH THE BAKELITE MOLDED TEAR BOMB CLUB 599

TECHNICAL ABSTRACT SECTION 606

AND NOW IN CLOSING, EDITORIAL 614

Advisory Board

B. F. Conner
William J. Hale
John E Jackson
Carl S. Miner
E. E. Novotny
E. Emmett Reid
Charles W. Rivise
Joseph Rossman
Robert C. Schupphaus
John H. Stevens
John P. Trickey

Robert H. Allen
James B. Neal
John G. Rossiter
Frank H. Shaw
L. F. Stratton

Carl Marx
Editor

Nicholas Klein
Managing Editor

R. C. Gilmore, Jr.
General Manager

A. C. Blackall
British Correspondent

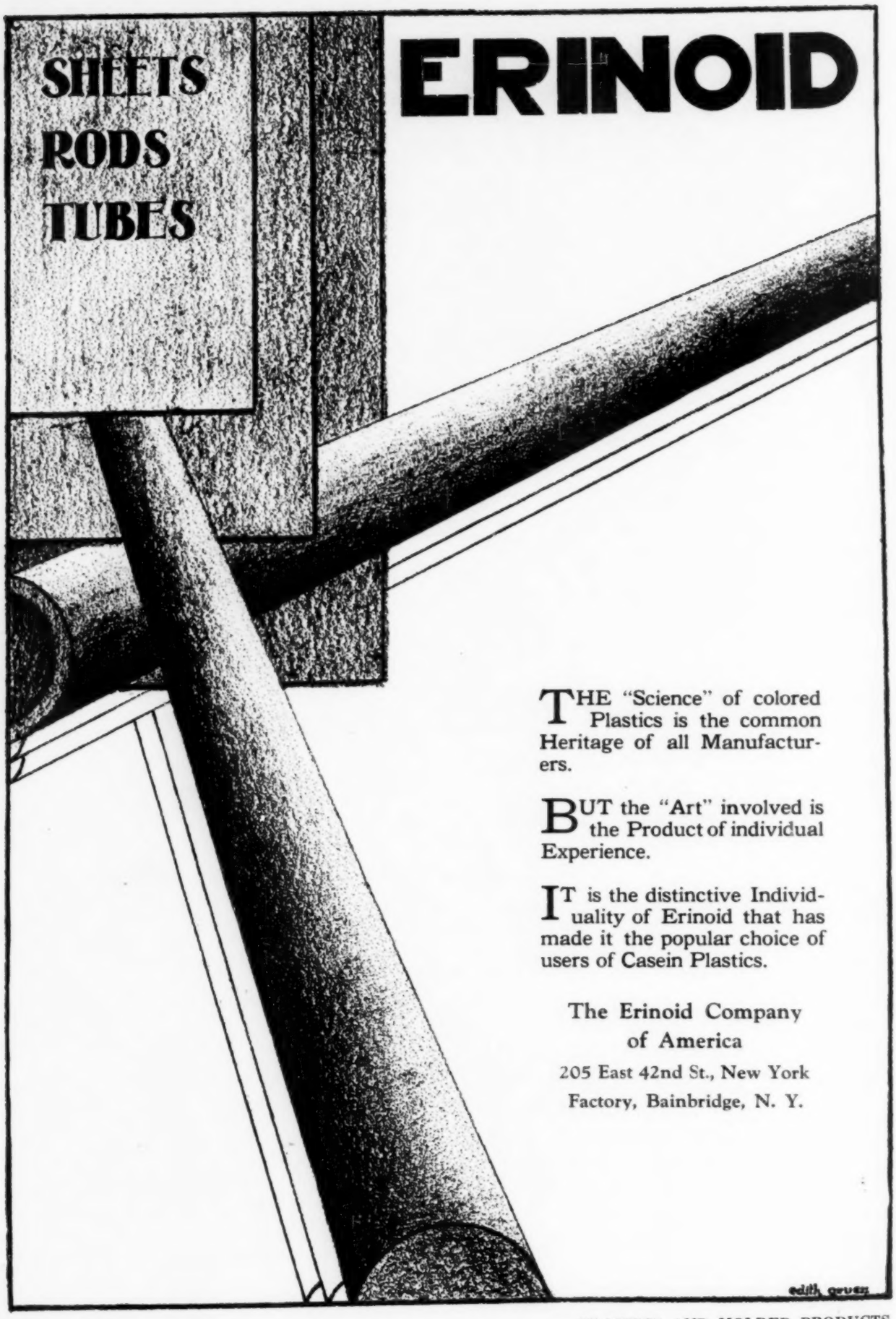
Heinrich Prehn
German Correspondent

All editorial and advertising communications should be addressed to the business offices, 114 East 32nd Street, New York, N. Y. Telephones, CALedonia 5524,5. Foreign advertising representatives, Willing Ltd. 362 Gray's Road, London, W.C.1 and The A.D.S. Service, Berlin.

Subscription Price, Domestic $3.00. Foreign, $4.00 per year. Single copies 35 cents; back issues, 50c. Publication Office, Washington, N. J.

Contents Copyrighted, 1930

PLASTICS PUBLICATIONS, INC., PUBLISHER


SHEETS
RODS
TUBES
ERINOID
THE "Science" of colored Plastics is the common Heritage of all Manufacturers.
BUT the "Art" involved is the Product of individual Experience.
IT is the distinctive Individuality of Erinoid that has made it the popular choice of users of Casein Plastics.
The Erinoid Company of America
205 East 42nd St., New York
Factory, Bainbridge, N. Y.
edith gerez

PLASTICS & MOLDED PRODUCTS
Reg. U. S. Pat. Off.

Volume 6 OCTOBER, 1930 Number 10

What Cost Duplication?

One of the problems of the molding industry and how one sales executive would remedy it.

By John G. Rossiter
Reynolds Spring Company, Jackson, Mich.

A VERY interesting fact is being realized more and more every day in the Plastics Industry and we have now stopped long enough to consider the effects of a practice, which is similar to the tactics of vultures applied to our business.

Realizing that the penalty of leadership is duplication, imitation and copy by competitors and yet, believing that the practice is wholly unwarranted in a field which is such a virgin one, it is hard to reconcile ourselves to the fact that we must continually combat activities of competitors who are keeping alive only by imitating and using sales channels in applications of Bakelite or other materials which have already been developed in new fields.

We know that nearly every good molder has developed a certain device or application for molded products in a new Industry. It is only reasonable to believe that the development cost of the application was many times greater than the possible profits for a long period of time. The molder's customer no doubt has profited by the use of a molded product and has, in many cases, been able to contend for first place in sales volume with a competitor.

The molder is happy with the thought that his development has really gone over and that there are possible profits in sight. It would be only fair that this molder has the opportunity to maintain leadership in the particular field, but vultures are as numerous in this industry as they are in the mountains. The little competitor without ability to develop anything, without the Engineering Department or costly Experimental Laboratory, does not have to consider the cost of maintaining a complete service organization and naturally is enticed or, in some cases, encouraged to take the business at prices which are not profitable, to say nothing of the losses to the pioneer in the field.

Premium for Initiative

I can see no reason why an organization which has studied a market and has decided to specialize in one particular industry, is not perfectly capable of producing molded parts at prices for the consumer equal to or lower than any molder who merely attempts to get the business, and certainly with better service. It is obvious that the fellow who thought of the application first has put a great deal of time and money into protecting himself with skill or talent and possibly highly efficient production methods, to make his application attractive to the customer, I have grave doubts as to whether the casual inquiry from the customer or the created interest of a competitor molder has taken into consideration the forethought, preparation and development cost which are necessary to convert the customer to the use of the molded product.

Our industry is so large that we have reason to believe it second only to the Metal Trades. There are so many applications for our materials which are as yet undeveloped that we do not believe it necessary to encroach upon the developments of another's ambitions. The condition which has existed in the infant Plastic Industry has proved that an economic error is made continually by duplication. A portion of the loss directed to the

development of other applications which produce hundreds of thousands of dollars in new business which would of course be apportioned to the most progressive organizations by virtue of their work and experience. I feel that there are new fields to enter which are more lucrative than any of our present developments and I know that all molders who are safe in their belief that the capital investment should show a small return, will accomplish a great deal more by creating rather than duplicating.

During the recent business depression we have found that it has been possible to level out the dip in our volume chart by the production of entirely new Plastic Products in industries which have heretofore not been considered within the scope of our market and production. The past year has given us an opportunity to prove our convictions in this thought and now, with our belief that most business depressions are psychological, that we can immediately reverse the present one by acts of confidence and a plan to enter additional fields which we find are very receptive to the use of molded, plastic materials, we enter upon the creation of more useful and newer markets, in turn more profitable, to catch the business rebound.

Where Custom Molders are Going to Get Some New Business

Many Molded Applications are Still Open for the Diligent Searcher

By H. S. Spencer

General Plastics, Inc., No. Tonawanda, N. Y.

NO one can ever figure out where all of the future business is going to come from, but "Thar's gold in them thar hills"; that is very certain. It's the getting out that puts blisters on the prospector's hands.

What do we see in the hills? First, our old friend the radio. Midget sets seem to be occupying considerable attention, and it would appear that a little prospecting should develop some molded cases for midget sets. There is nothing new about molded radio cabinets. England has been making them for some time. The English midget cabinet is even larger than most of the midget sets being constructed. Automobile radio did not startle anyone this year but it still has possibilities, and several automobile manufacturers are not building their cars with concealed aerials without purpose.

The clock business—electric clocks. Who, having an electric clock is going to bother winding one again. The spring clock is just like Dad's pocket chronometer with its one front door and double back entrance and its separate key that was always in the other vest. What automobilist, golfer or aviator is going to open his watch to see the time. In this fast moving age, few will look beyond the wrist, and as for the opening of the two rear doors and the finding of the key with which to wind it, that's as old-fashioned as cranking a car. The electric clock is replacing the spring clock which must be wound daily or weekly. Molded cases are just as modern as electrically controlled clocks and should be a part of them.

A number of representative clock manufacturers have already adopted the molded case. There are many more and the majority will follow.

Packaging and molding have only just met. Nobody needs help more than those manufacturers who depend upon the box to assist in sales attention and a more modern method of packing their products. Manufacturers making fine products, do not want to put them in, nor can they afford, inexpensive or inattractive containers. Then, too, there is the element of permanency of the molding material over wood or paper; the tarnishing of metal, the shaping and actual breaking of

glass, and there is a place for some good work in the manufacture of jars for cold creams and other facial creams, soaps, etc. Jars should not be of the conventional type but should indicate greater thought to beauty in design and color, as well as containers of all sorts. Adhesive tape could be more attractively and conveniently pacakged. Mucilage—there is no container for mucilage that is an ornament to the desk or library. There is a place for an attractive combination of molded compounds and metal in paper weights—made sufficiently inexpensive that they could be used for advertising and something beyond the conventional in design.

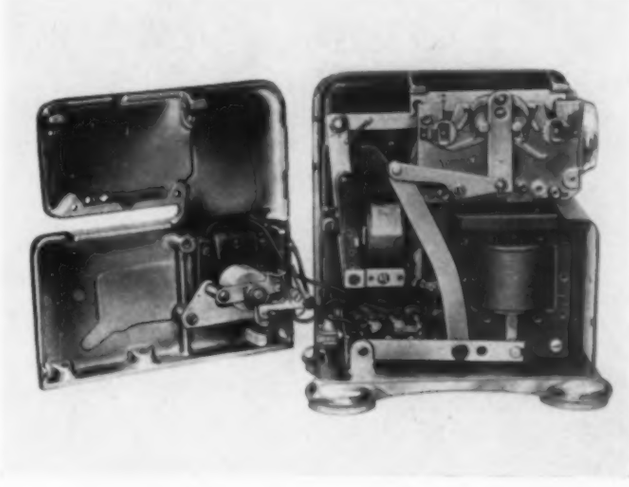
Paper weights approach the over-worked claim; the ash tray and cigarette novelties. On all of these go slowly. Here, if you must get into it, there is business; but from a proprietory angle be sure that there is gold in the claim before you work it, for a smoker's article must be a novelty and real novelties should retail in the neighborhood of a dollar each if they are to go big.

Molding and Marketing

Now, the higher hills—and the harder to work claims. Here is a perfectly logical use for molding compounds, yet no real business has been done. Door knobs require a real merchandising job. It is an ideal application for phenolic materials. Such door knobs as have been made have been marketed successfully, but the real market has not been approached. Advertising in the architectural magazines is good, but alone it is never going to get much gold out of the hills. Obviously, door knob manufacturers are not keen on molding compounds. That is, their plants are equipped for stamping them out of brass or casting them. The workers are trained in this work. Molded knobs mean a change. The making of parts outside of their plant or the installing of equipment — yet molded door knobs will come and in a large way, because the use is practical. They are superior to any material used at comparative cost, pleasing to the touch, never cold, sanitary, etc.

Toilet seats are being molded, but like door knobs not very extensively. Here is an excellent application. Colors, permanency, no chipping or marring, and, outstandingly, their qualifications from the sanitary standpoint. The specialist, if he is all his name implies, would agree on the sanitary feature as sufficient argument in itself.

The custom molder must think more about new jobs, only a few of which are mentioned here, and everyone having read this far, has undoubtedly thought of a half a dozen jobs that have not been mentioned. This is not as important as working out a plan whereby the job will be brought through, and the gold brought out of the hills. Much of the work calls for a real merchandising campaign, a job too big for most of the independent organizations in the business and it would seem that for successful results, an effort of this kind should be a co-operative one with all factors of the industry sharing the burden of the expense. Past history shows much of the effort made has been lost through duplication and competitive practices that are not helpful to the industry as a whole.



Durez Answers the Call of "Front"

THE Instograph time recording device required a material that would stand pounding —the hammer blows of the room clerk in all his moods. So the plunger of the Instograph was molded out of Durez—the plunger that would descend and perform, as the force directing it pleases, and under these varying moods, obtain a uniform and satisfactory result. An exacting requirement, but Durez material is meeting it.

The Insto automatic electric time recorder is an individual self-contained unit which may be operated by merely plugging in on the regular AC or DC service line at any convenient point. It is designed for use in stamping the date and time on orders, mail, wires, service calls, etc.

Insto is the only recorder on which the time record may be obtained by merely inserting the paper into the machine; such insertion causes an electrical contact which automatically produces the printing blow.

Besides the plunger, a number of other parts for this device are molded of Durez.

It is molded by Gray & Danielson Manufacturing Company, 2101 Bryant Street, San Francisco for Instograph, Limited, 1241 High Street, Oakland, California.

THE "BIG FIVE" ON MOLDER TRADE EXTENSION

ROBERT H. ALLEN is Sales and Production Manager for the American Record Corporation of Scranton, Pennsylvania. During the thirty-five years since his birth he has applied hard work as the keynote of success. Educated in the public schools and with two courses of Practical Mechanics and Business Administration, he experienced unusual training as a blacksmith helper and steam-hammer operator in a railroad shop and as a molder in an iron foundry. His twenty years of service with American Record (Scranton Button) was broken only during the World War when he served in the famous Col. Cook's Flying Circus. He has a thorough knowledge of all molding procedure and especially of mixing, the basis of molded work. In 1924 he was promoted to Assistant Superintendent and two years later, in the expansion of business, took over his present duties. "Bob" Allen refers to "his dealings with customers as pleasant and enjoyable, and believes his greatest hobby is "serving satisfactorily".

ROBERT H. ALLEN

JAMES B. NEAL

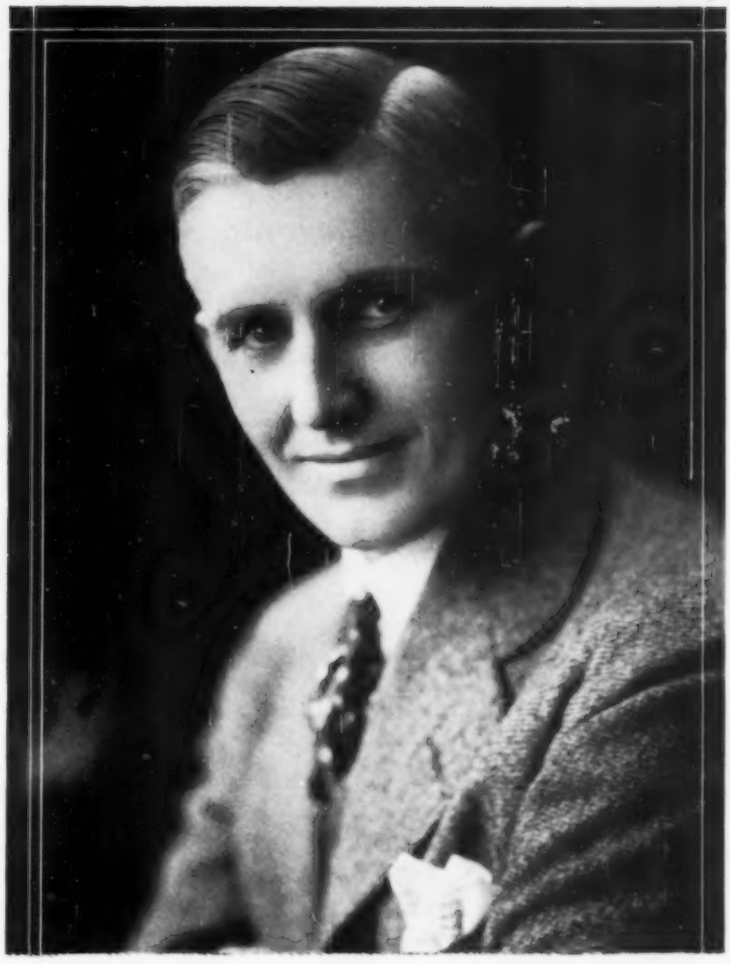
F. H. SHAW

L. F. STRATTON

F. H. SHAW, "Frank" to you, has been associated with his father since high school days (1912) as Vice President and Treasurer of the Shaw Insulator Company, Irvington, New Jersey. The fact that this company was founded in 1892, two years before Frank was born, has nothing to do with parental expectations, but in recent years much of the guidance and policy of the business has been left to his capable management. He has been the leader of many reformations in the business and has done much to cement good feeling between Eastern molders. Frank is married and has one child, a son. His chief recreation is golf and his highest recommendation, business. He has devoted much of his time to development work on new materials and methods.

JAMES B. NEAL was born thirty-seven years ago in Braintree, Massachusetts. It is true that this town was the birth-place of two Presidents of the United States, but this was many years ago. He was educated in New England and graduated from the Massachusetts Institute of Technology in 1915 with a B. S. degree in Chemical Engineering. He then entered the employ of the U. S. Rubber Co. for a brief period and in March, 1916, went to Lockport, New York, to enter a new company and a new proposition; the manufacture of metallic magnesium by electrolysis from magnesium chloride. This was largely a war development and was given up shortly after the Armistice. For five years Jim worked in a wide variety of development activities in association with Johns-Manville, with whom, at that time, Norton Laboratories were connected. Special work was undertaken on plastics in 1922 and in 1925 all other activities were discontinued, and Neal's entire staff concentrated on the plastic industry. Since then our "subject" has become President of the company. He believes in a square deal for employees as well as customers.

L. F. STRATTON is one of the leading men in Middle Western molding circles. He has been connected with the Belden Manufacturing Company of Chicago for many years in the development of electrical wiring devices and molded products for the electrical industry. At the age of thirty-six he occupies the responsible position of Sales Manager, is married and has a son, and, together with Belden's Vice President, Mr. Parsons, has established a record of plant control between Chicago and Richmond, Indiana, where their new plant is located.



John G. Rossiter

SOME people refer to John G. Rossiter as the "white-haired boy" of the plastic molding industry. It is surely safe to say, though, that some of those white hairs have been caused by the problems that he has faced as one of the leading executives of that industry. As a mark of the esteem in which he is held by the leading manufacturers of the country who make up the Molded Insulation Section of the National Electrical Manufacturers' Association, Mr. Rossiter has been selected chairman of the all-important Trade Extension Committee which is doing notable work in opening up new channels for molded plastic materials and is arousing a consciousness, in the industry, to uphold clean, ethical business practices.

■ John G. Rossiter was born thirty-five years ago in Mattoon, Ill. After the World War, in which he served with the 338th Battalion Light Tanks, he entered the employ of the Reynolds Spring Company and was assigned the position of Superintendent of the Molding Division. Here he installed what was at that time one of the first complete semi-automatic molding plants in the industry. Recognizing that the plastic field was destined to become one of the great industries of the future, he made a study of the business from all angles so that he is now recognized as one who has a thorough knowledge of the molding business and its possibilities.

■ After developing the plant to the modern present day method of production, Mr. Rossiter's activities were transferred from production to development and sales where during the past five years he has built up a noteworthy record for himself. His vision and interest have made possible the application of plastic materials to many devices in the electrical, automotive and mechanical appliance fields. Mr. Rossiter also developed the Reynolite line of electrical household devices which enjoy the highest reputation and which have come to be nationally known.

■ In a word, John G. Rossiter personifies the new spirit of the plastic molding industry. He combines knowledge of his product and process, familiarity with outlets and broadening markets, appreciation for his competitors and highest service for his customers. The plastic molding industry greets John G. Rossiter.

What *is* Patentable in Plastics?

A concise but lucid interpretation of our patent law, for the guidance of the inventor, investigator and inventor.

By Charles W. Rivise

The question so often arises as to whether a thing is new, and patentable. Our courts have struggled with the question "what is invention?" for years.

The principles evolved as the result of a long line of decisions are herein laid down in the layman's language.

The author was for many years an examiner in the United States Patent Office and is now a practicing attorney specializing in Patent Cases.

AN inventor is one who has made a valuable discovery. At common law he had no special property right in his brain child. The only way he could keep others from using his invention was to withhold all knowledge of it from the public. This he could do either by suppressing it entirely or by practising it as a "trade secret".

In the first case he deprived not only the public but also himself of all possible benefit of his genius. In the latter case he could reserve to himself the exclusive use of his discovery only so long as he succeeded in keeping its details from the public. To do this he had to take all sorts of precautionary measures and resort to all sorts of subterfuges such as allowing misleading information to fall into the hands of his competitors and marking the thermometers and gauges with false scales so that only he or some trusted employee could read them.

When to Patent or Not

However, even with the greatest precautions there was always the possibility that a competitor would stumble across the secret by accident or rediscover it by analysis and experimentation. In one instance an enterprising competitor is said to have discovered a very carefully guarded secret by analyzing the sewage from the plant of his rival. And there are numerous instances in which a closely guarded secret yielded to a careful analysis of the product.

Another danger that could not always be guarded against was the divulging of the secret by a faithless employee. It is true that in such a case the Courts will prevent a dishonest competitor from availing himself of the stolen information, but as frequently happens, the general public also learns the secret and it becomes public property.

Under such a system the arts and sciences could make but very slow progress. Realizing this, the framers of our Federal Constitution laid the basis for our present patent system, under which the government promises to protect the inventor in his exclusive enjoyment of the invention for a term of years provided he makes such a full and exact disclosure of his invention that the public can practise it after the expiration of the inventor's monopoly rights.

However, it must be borne in mind that the Patent statutes do not compel an inventor to apply for and obtain a patent. If his discovery is of such a nature that he feels that it is safe from discovery either by observation of his invention, or by independent investigation and experimentation, he would have a much more endurable monopoly by refusing to take advantage of the Patent Laws. Such is his natural right. It is only when he fears discovery and resultant injury from the exercise by others of his invention that he need protect it by a patent. However, the inventor who elects to protect his invention by secrecy rather than by seeking patent protection always runs the risk of losing his right to a patent when his secret leaks out.

When a Secret Leaks Out

Such was the situation in the case of Mac Beth Evans Glass Co. vs. General Electric Co. reported in 246 Federal Reporter 695. In that case it appeared that the Mac Beth Co. had for a period of ten years made glass under a secret process until the secret was stolen by a competitor through a dishonest employee. Suit was brought against the competitor and he was enjoined from making use of the stolen information. The details of the process, however, leaked out and the Mac Beth Co., to protect its rights against other competitors, applied for and secured a patent. Suit was then brought against the General Electric Co., one of the competitors, to stop it from infringing the patent, but the Court held the patent invalid on the ground that by choosing to keep its process secret, the

All rights reserved by the author. Copyright, 1930, by Chas. W. Rivise. Not to be reproduced or translated.

Mac Beth Co. had abandoned its right to patent protection.

Disclosure of the Invention

In order to take advantage of the protection afforded by the Patent statutes, the inventor is required to make a written description of his invention or discovery and of the manner and process of making, constructing and using the same in such full, clear, concise and exact terms as to enable any person skilled in the art or science to which the invention or discovery appertains, to make, construct, compound and use the same. Any disclosure that falls short of this requirement will result either in the refusal of a patent or in the grant of an invalid patent.

Thus, in the case of Featheredge Rubber Co. vs. Miller, reported in 259 Federal Reporter 565, Patent No. 1,045,234 to Willis and Felix for a method of making rubber sponges was held invalid on the ground that the patentees in order to deceive the public had omitted several essential details of the process from their disclosure. As a result experts in the art had difficulty in duplicating the result claimed to have been obtained by the inventors.

Details

It must be emphasized, however, that the inventor is not bound to state all the advantages and functions of his invention or all the uses to which it may be put. Neither is he required to state the scientific principles or theory underlying his invention or the causes which produce the desirable result. And if he does state what he believes to be the principles governing his discovery, it is wholly immaterial to the validity of the patent whether or not the statement is correct, so long as he has so set forth the thing to be done that it can be reproduced by one skilled in the art.

An interesting case involving this point is that of Knick vs. Bowes "Seal Fast" Corporation reported in 25 Federal Reporter (2nd) 443. In this case the defendants who were charged with infringing Patent No. 1,489,477 to Bowes for a method of patching rubber articles such as tubes sought to escape liability on the ground that the inventor in his patent had erroneously stated that buffing the surface to be patched in the presence of a softener and solvent served to devulcanize the rubber. The Court summarily rejected this argument with the statement that the patent clearly disclosed what was to be done and that an understanding of the theory was not necessary to carry out its teachings.

Patent Claims

The law further requires the inventor to point out and distinctly claim the part, improvement or combination which he claims to be his invention or discovery. This he must do in one or more short statements at the end of the description. Each one of these statements is termed a claim.

The claims are the vital part of the patent and define the scope of the patent. Great skill is required in drafting them. Usually the Patent Examiner does not agree with the inventor that the presented claims represent his contribution to the art. In such cases the inventor may amend the rejected claims or try to persuade the Examiner to his own way of thinking. When the inventor and the Examiner finally agree, the patent is granted with the claims agreed upon. If they cannot agree, the inventor may appeal to a higher tribunal in the Patent Office and then to the Courts. But, if the inventor acquiesces in the rejection of a claim and the patent is granted with a narrower claim, he is forever estopped from contending that he was entitled to the broader claim.

Such was the situation in the case of Leonard vs. Corn Products Co., reported in 139 Fed. Rep. 734, involving Patent 615,-863 to Leonard for a rubber substitute. The claims as finally granted were limited to a composition made by heating a mixture of corn oil, sulphur and paraffin until vulcanization occurred. The patentee contended that he was entitled to a broader claim omitting the paraffin, which served only as a mold lubricant. The Court, however, held that by acquiescing in a Patent Office rejection the inventor had lost his right to the broader claim. He, therefore, could not recover against the defendant who omitted the paraffin and used talc dust to prevent the composition from sticking to the mold.

A similar situation existed in the case of Celluloid Mfg. Co. vs. Arlington Mfg. Co., reported in 52 Fed. Rep. 741. Patent 199,908 to Hyatt was held limited to affixing a sheet of celluloid to a plate by means of the contractile power of the celluloid developed in cooling of the mass. The defendant had no difficulty in avoiding this limitation.

Each claim in a patent is considered a separate and independent invention. One may be valid, all the rest invalid. But, the claim that is good remains good and is unaffected by the presence of those that are bad. Likewise, one claim may be infringed and the others not. In other words, the patent does not stand or fall as a unit, each claim is in effect a separate patent.

Patentable Subject Matter

No matter how ingenious or epoch making an invention or discovery may be, no valid patent can be secured, unless the subject matter thereof can be expressed in one or more of the following ways:—

(1) An art;
(2) A machine;
(3) A manufacture;
(4) A composition of matter;
(5) An improvement on an already existing art, machine, manufacture or composition of matter; or
(6) A design for an article of manufacture.

Each of these terms will be

(*Continued on page 590*)

Plastics and Food and Fountains

Seven million meals served daily owe much of their attractiveness to the molded and laminated plastic equipment.

By Zaida A. Ellis

Bakelite Corporation, New York City

THE relation of the soda fountain field to the synthetic resinoid industry is an interesting study which, upon investigation, gives to manufacturers, molders, and laminators of synthetic resinoids some most inspiring, more or less surprising facts. These relate principally to the rapid growth of the field and to the corresponding demand which is being developed for molded and laminated phenol resinoids in fountain equipment.

Molded handles have been in use for some time on ice cream scoops, spades, knives, percolators, toasters, and other fountain equipment. There are also molded covers for ice cream cabinets and fruit syrup dispensers, molded containers for cold drinks and sundaes, and drip and extractor cups in orange juice extractors. The list increases steadily.

In many new installations—of which there are about ten thousand a month—effective use is made of wall panelling of Formica or Micarta, brands of the laminated resinoid. These materials are furnished in various marble and wood finishes, solid colors, and modernistic designs. Their claim to popularity lies not only in their range of beautiful colors and designs, but also in their permanency.

Table tops, counter tops, and counter trim of Formica and Micarta are becoming increasingly popular. As in the case of wall panelling, the marproof surface of the laminated resinoid greatly enhances its desirability for table tops. The tables in the Priscilla Fountain Room, in the Brooklyn department store of Abraham & Straus, show an effective use of Bakelite resinoid in combination with tubular metal. These tables were the direct outgrowth of the modern art movement to find new furniture and decorative materials which would best represent this machine age. The first coffee and smoking tables of this type appeared at a comparatively recent date in the exclusive shops of interior decorators. Because of their extremely practical construction, of untarnishable metal and marproof resinoid, there was an almost instant demand for them as equipment for countless coffee shops, tea rooms, and fountain rooms.

Stool seats and bases are now being molded of the phenol resinoids, and will soon take their place with the other molded fountain accessories. With the exception of the stools, all of this fountain and tearoom equipment, both molded and laminated, has now been in use long enough to pass the most severe tests as to strength and permanency of finish. Were strength and permanency the only qualifications, possibly the demand for phenol resinoids in the fountain field might not be long-lived, for modern man is being trained by modern manufacturers to look for and demand beauty of line and material. Even the simplest, most inexpensive objects, are carefully designed to meet the requirements of art before being

Bakelite cup holders—quiet, colorful, and sanitary. Bakelite molded ice cream compartment cover. Nickel silver was replaced.

Industrial twin to the soda fountain is the modern lunch counter. Serving surfaces of laminated resinoid are standard, as here in the Hotel St. George, Brooklyn.

manufactured in mass production. On this score, the resinoids have no competition to fear. They have beauty of color and beauty of finish. In molded objects, proportion and line are faithfully reproduced. In the laminated resinoid, whether in modernistic design, solid color, or simulation of wood or marble, the surface finish is unique in its perfection.

In the twin field of lunch counter equipment, there is an almost equal demand for laminated and molded resinoids. Here again the laminated counter tops are used, as is evidenced in the picture of the Hotel St. George swimming pool lunchroom. Here, too, there is the same need for molded covers for ice cream containers, and molded handles on knives, scoops, percolators, waffle irons, and toasters.

Fountain Facts

Interesting statistics have been compiled by the publication, *Soda Fountain*, as to size of this field which the phenol resinoids have entered. There are, in round numbers, 100,000 soda fountains in the United States; 10,000 in New York City alone. Over 10,000 new fountains are being installed each year, less than half of which are replacements. This means 5,000 new purchasers for laminated and molded fountain equipment each year. The total yearly business amounts to more than two billion dollars, with an average annual increase of approximately 23 per cent. In addition to counter stools, 74 per cent of the fountains are operated in conjunction with refreshment tables and 56 per cent with booths. Of the over 100,000 fountains, some 60,000 are located in well-established stores, and do approximately 90 per cent of the total business in this two-billion-dollar trade. Sixty-seven per cent of these 60,000 soda fountain stores serve meals, and they all serve candy. Their annual business in foods alone is over $560,000,000. According to *Soda Fountain* statistics, this means that **over seven million people eat at least one meal each day at a fountain.**

In New York City, the new fountain opened by Childs in the basement of the Paramount Building is the rendezvous for "Who's Who" along Broadway. Almost any New Yorker descending to this soda fountain for a "combination ham and Swiss cheese" may find himself occupying a leather topped stool beside Adolph Zukor or Jesse Lasky, or perhaps the famous organist of the Paramount Theatre, Jesse Crawford. There is an 80-foot bar at this Childs' fountain, and a supplementary bar 32 feet in length. Childs has already introduced the soda fountain into five restaurants. A feature of the Childs restaurant recently opened in the Savoy Plaza Hotel Annex is the soda fountain in the 59th Street entrance. Another large fountain with a 114-foot counter, is being opened in Gimbel's Department Store in New York City. It is situated on the first basement level of the store with a large entrance to the tunnel running between the Holland Tubes and Pennsylvania Station. It caters not only to the great Gimbel crowds, but also to the many thousands of people passing through the Tunnel. Visioning the great throngs of people who travel this thoroughfare daily, it is not difficult to be convinced that "seven million people eat at least one meal each day at a fountain". The custom seems to be an almost universal one.

A Bakelite handle is molded integral with the steel shank of the knife blade—for keeps. Ice cream tools. Green Bakelite molded handles—non absorbent.

Glorifying a great American institution—the soda fountain—in modern setting of marble, metal, and Bakelite resinoid. The resinoid research achievement is present as table tops in this popular department of the Abraham & Staus store in Brooklyn.

Eating Estimates

"Soda fountain" is fast becoming a misnomer for the long gleaming counter backed with banks of syrup and ice cream containers, for the volume of food served far overtops the volume of regular fountain products. To return to *Soda Fountain* statistics, average daily fountain sales, including food, is $111.71. That of fountain sales not including food is only $24.23.

All of which goes to show that Meredith spoke the truth when he said:—

(*Continued on page 595*)

Observations as to the Formation of Synthetic Resins

Fundamental classification of the resinoids; mechanism of their formation, and postulates derived from the observed reactions.

By R. H. Kienle

General Electric Co., Schenectady, N. Y.

A general survey of the synthetic resins and other high-molecular-weight compounds shows that it is possible to classify them on the basis of either their ability to gel or the mechanism of their gelation. This yields three classes, namely heat-convertible, heat-nonconvertible, and element-convertible.

Investigations herein described allow the setting up of definite postulates leading to a suitable explanation of the various physico-chemical and colloidal properties of this class of organic compounds.

BY MEANS of a general survey of various observations on the formation of organic compounds of high molecular weight in general, and of synthetic resins in particular, certain postulates can be set up such that, starting from these postulates and taking the ordinary chemical reactions into account, the formation of synthetic resins and certain of their physico-chemical properties can be predicted. It is not proposed that these postulates are necessarily final, but they do give a rather simple conception as to the formation of high molecular-weight organic compounds. The application of these postulates in the laboratory over a period of several years has developed confidence to the point that it is believed that their general use will help materially in bringing about a more rapid advancement in this field.

Historical

Several treatises (*3, 8, 22*) are available dealing in detail with the preparation, properties, and uses of the known synthetic resins. In only one of these (*22*) do we find a serious attempt to deal with the underlying causes of synthetic resin formation.

One of the earlier explanations for the peculiar properties possessed by these high-molecular-weight organic compounds was that proposed by Ostwald (*19*). Because these substances in their reactions and formations went through certain physical changes akin to those found in dispersoids, he used the term "isocolloid" to identify them and proposed the application of colloidal concepts. The possession of colloidal properties by high-molecular-weight organic compounds is without question, but the necessity of using strictly colloidal concepts, similar to those required to explain the properties of dispersoids, is another matter. Krumbhaar (*16*), Wolff (*27*), Schieber (*21*), Auer (*1*), and others have applied such colloidal concepts with varied success to explain the reactions that occur in drying oils, one class of high-molecular-weight organic compounds. Following the establishment by x-ray analysis of definite periodicity in the structure in such substances as rubber (*7*), cellulose (*10*), polyoxymethylene (*11, 20*), polyvinyl acetate (*26*), it is not surprising that Mark and Meyer (*17*) proposed their so-called "micellar" theory. This theory states that in high-molecular-weight organic compounds a number of recurring atomic groups are linked together into chains by primary valence forces, and that bundles of these chains are subsequently associated into groups by secondary forces to form micelles, which, acting as entities, are responsible for the colloidal properties. The micellar theory, however, can hardly be used to predict properties.

Other Investigations

We also have the investigations of Staudinger (*23, 24*), Herzog and Kreidl (*12*), Whitby (*25*), Carothers (*4, 5, 6*), Kienle and Hovey (*15*), who show the importance of considering the chemical bonding of the molecules when dealing with the formation, constitution, and properties of high polymers. Staudinger and his collaborators studied substances whose reactions involved only polymerization—as, for example, paracetaldehyde, polyoxymethylene, polystyrene, butadiene, cyclopentadiene, and rubber. Staudinger (*23, 24*) has published a summary of his investigations, in which he points out that in every case he has investigated long-chain molecules are formed through primary valence bonding of the interacting molecules and that these are responsible for the colloidal properties.

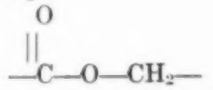
Carothers and his collabora-

Presented before the Division of Paint and Varnish Chemistry at the 79th Meeting of the American Chemical Society, Atlanta, Ga., April 7 to 11, 1930.

Reproduced by special permission of the author, and editor of Industrial Engineering Chemistry, June, 1930, 22, pp. 590-594.

tors (*4*, *5*, *6*) investigated another class of high polymers—those whose reactions involved condensation, such as the glycol-dibasic acid esters—and concluded that they also had long-chain molecules. Carothers in these investigations invariably obtained neutral polymers, none of which jelled. On the other hand, Kienle and Hovey (*15*), also investigating the poly esters, but working with glycerol instead of the glycols, showed that, although again only ester formation was involved, gelation readily occurred. This marked difference between the glycol and glycerol poly esters indicates that the formation of chain molecules in itself is not a complete explanation.

Herzog and Kreidl (*12*) carried out their investigations on strictly resin-forming substances. They came to the conclusion that before a resin will form, certain characteristic atomic groups must be present. To these they gave the name "resinophores." But when applied to the alkyd resins, this theory fails. Inasmuch as the alkyd resins are esters, it follows from their theory that the ester group



should be a resinophore. Therefore, all esters should either be resins or possess resin-forming properties, which is certainly not the case.

Classification of Synthetic Resins

In order to have in mind a thorough perspective of synthetic resins and other high polymers, a review of the current classifications seems warranted. These are based on (*a*) the formation reactions, (*b*) the colloidal forms, and (*c*) the physical properties of the high polymers.

BASED ON FORMATION REACTIONS—The classification based on the reactions that occur during formation has been used by Scheiber and Sändig and by Carothers, and is as follows:

(1) Polymerization (A polymers)
Examples: Olefins and poly-olefins, unsaturated hydrocarbons, azo compounds
(2) Condensation (C polymers)
Examples: Poly esters, phenol-aldehydes, ketone-aldehydes, hydrocarbon-aldehydes, alcohol-phenols, phenols-sulfur chloride

BASED ON COLLOID FORMS—The classification based on the colloidal forms assumed by high polymers, introduced by Staudinger (*23*, *24*), is as follows:

(1) Association polymers
Example: Cellulose, silk
(2) Hemicolloidal polymers
Example: Styrene, polymerized warm
(3) Eucolloidal polymers
Example: Styrene, polymerized cold

BASED ON PHYSICAL PROPERTIES—The classification based on the physical properties of synthetic resins and high polymers depends on the ability or inability of high polymers to convert from a readily fusible condition to a non-fusible condition under the action of heat or in the presence of elements such as oxygen, sulfur, etc. In this classification are three types of resins or high polymers—namely, heat-convertible, heat-non-convertible, and element-convertible. Kienle and Ferguson (*14*) have used this classification, but instead of element-convertible they spoke only of oxygen-convertible. However, the former is a more general term covering any chemical element and is therefore preferable. Applied generally, this classification is as follows:

(1) Heat-convertible
Examples: Poly-olefins, acetylene derivatives, glycerol-poly-acid esters, phenol-aldehydes, drying oils
(2) Heat-non-convertible
Examples: Olefins (styrene), glycol-poly-acid esters, certain phenol-aldehydes (acid type), triolein
(3) Element-convertible
Examples: Olefin-sulfur, glycerol-poly-acid-unsaturated acid esters, blown oils

Theoretical

From a number of observations, which will be discussed shortly, together with such a general survey as has been given, it has been possible to set up three postulates which seem to account for the formation and properties of synthetic resins and other similar high polymers.

Postulate 1—High-molecular-weight organic compounds are formed only when the interacting molecules are poly-reactive.

Restated, this postulate says that molecules which interact to form high polymers must possess the ability of uniting with one another through more than one primary valence bond. When applying this postulate, the reactivity of any substance is defined as the number of primary valence bonds which are active in the reaction under consideration. To illustrate, styrene, $C_6H_5CH{=}CH_2$, containing one active unsaturated group per molecule, is di-reactive in the reaction

$$\text{Styrene} \overset{\text{heat}}{\rightleftharpoons} \text{meta-styrene}$$

(*23*, *24*) Extending this notation to the entire reaction, its reactivity can be expressed in the form $(n_1, n_2 \ldots)$, when n_1 and n_2 represent the respective reactivity of the components. Accordingly the reactivity of the foregoing reaction would be (2,2). Obviously it follows that before the reactivity of a substance can be specified the type of chemical combination occuring must be known.

The reactivities of some of the more common substances used in synthetic resins are given in Table I.

Postulate 2—The interlinking of the molecules proceeds according to the chance contact of any two individual reactive points.

This postulate introduces the concept that the molecules unite as determined by the probability of contact (*13*) of mutually reactive primary valence bonds.

Postulate 3—The relative size and shape of the reacting molecules and the position of the reactive points largely determine the physical properties of the resulting polymer—e. g., hardness, flexibility, heat convertibility, etc.

While the first two postulates were chiefly concerned with the formation of synthetic resins and other high polymers, the last postulate refers to their physical and chemical properties.

Table I—Reactivities of Common Resin-Forming Ingredients

Ingredient	Type of Reaction	Reactivity
Styrene	Polymerization	2
Sulfur	Direct union	2
Olefins	Polymerization	2
Glycol	Condensation (ester)	2
Glycerol	Condensation (ester)	3
Phthalic anhydride	Condensation (ester)	2
Linoleic acid	Condensation (ester)	1
Linoleic acid	Polymerization	4
Phenol	Condensation	2
Formaldehyde	Aldol union	2
Formaldehyde	Condensation	2
Urea	Condensation	2-4
Coumarone	Polymerization	2

Data and Discussion

These postulates are based on only one assumption — that ordinary chemical valence forces are practically the only forces active in the formation of high-polymer organic compounds. This assumption has been defended by Staudinger (*23, 24*) and, indeed, the investigations of Staudinger, Whitby, Carothers and collaborators seem to substantiate it.

Certain physico-chemical investigations on typical high polymers also suggest the validity of this assumption. In these investigations the temperature coefficient of reaction for a typical heat-convertible, heat-non-convertible, and element-convertible high polymer was determined. From the temperature coefficient the heat of activation of each of the reactions was calculated. As shown in Table II, the calculated values of the heats of activation lie between 22,000 and 28,000 calories, an order of magnitude frequently observed. In obtaining the temperature coefficients for the several reactions, the time required to reach a certain stage in the reaction for temperatures T and $T+10$, respectively, was determined. As this time is inversely proportional to k, the reaction-velocity constant, the temperature coefficient could be calculated using the equation.

$$\frac{k_{T+10}}{k_T} = \frac{t_T}{t_{T+10}}$$

There is still another indication of the validity of the foregoing assumption in the experimental fact that carrying the temperature-reaction velocity studies, as just described, over as wide a temperature range as possible, straight lines inevitably result when the times to reach a certain stage in the reaction are plotted on semi-log paper against the reciprocal of the absolute temperature. (Figure 1) This is as required by Arrhenius' equation concerning the effect of temperature on the rate of a chemical reaction.

Table II—Temperature Coefficients of Several High-Polymer Reactions

Type of Reaction	Reactants	Method of Following Reaction	Temperature Coefficient	Heat of Activation Calories
Heat-convertible	Glycerol, phthalic anhydride	Physical	215-225° C. 1.50	27,800
Heat-non-convertible	Glycol, phthalic anhydride	Chemical	215-225° C. 1.43	22,600
Element-convertible	Drying oil, oxygen	Optical	295-305° C. 1.42	22,500

Let us now examine a number of synthetic resins and other high polymers and see how the above postulates are substantiated. See Tables III-VII.

Table III—General Survey of Synthetic Resins and Other High Polymers

Reacting Molecules	Reactivity	Formation	Chains	Mol. Wt.	Type of Resin
Styrene	2,2	Heat ⇄	Long	Very high	Non-convertible
Formaldehyde	2,2	Heat ⇄	Long	Very high	Non-convertible
Glycol, phthalic anhydride	2,2	H_2O →	Long	High	Non-convertible
Cyclopentadiene	2,2	Heat ⇄	Long	High	Non-convertible
Glycerol, phthalic anhydride	3,2	H_2O →	Short twining	Moderate	Convertible
Phenol, aldehyde (21)	2,2	H_2O → Saligenin type acid catalyst	Long		Non-convertible
Phenol, aldehyde (21)	4,2	H_2O → Alkaline catalyst	Short twining	Moderate	Convertible
Cyclopentadiene	4,4	Heat, pressure →	Short twining	Moderate	Convertible
Drying oil, oxygen	6-8,2	Heat →	Short twining	Moderate	Convertible
Isoprene, sulfur	4,2	Heat →	?	?	Convertible

Applications

Postulate 1—The first fact these tables show is that no high polymer is formed unless the reaction reactivity is (2,2) or greater; i. e., poly-reactive molecules must be interacting. If the reactivity is (1,1), (1,2), (1,3), etc., only simple com-

pounds result. It must not be inferred, however, that the presence of a mono-reactive molecule prevents high-polymer formation. Thus we have a class of alkyd resins prepared from glycerol, phthalic anhydride, and a monobasic acid. Actually it is when the only reaction occurring of the (1,1), (1,2), etc., type that no high polymer will form. In the alkyd resins just mentioned both a (1,3) and a (2,3) reaction are present, and a high polymer forms with the mono-molecules entering as part thereof. The observed facts are in accordance with Postulate 1.

When this postulate was first stated, it suggested as a test comparison of a mono-reactive with a di-reactive metal—e. g., sodium and calcium—in the glyceryl phthalate reaction. Theoretically, the sodium, being mono-reactive, ought to retard the reaction, as it will combine with the glycerol and phthalic anhydride, reducing their reactivities. The calcium, being divalent and reactive with both ingredients, should have no deterrent effect, since in accordance with Postulate 2 it should contribute to the molecular linkage. When this experiment was tried, the following results were obtained, confirming the predictions:

(1) Glycerol, 100 grams; phthalic anhydride, 243 grams: Calcium, 10 grams. Temperature, 220° C. Jelled after 80 minutes. Opaque, hard.

(2) Glycerol, 100 grams; phthalic anhydride, 243 grams. (Control experiment.) Temperature, 220° C. Jelled after 90 minutes. Clear, tough.

(3) Glycerol, 100 grams, phthalic anhydride, 243 mg.; sodium, 10 grams. Temperature, 220° C. Jelled after 120 minutes. Clear, dark, soft.

Postulate 2—Particular attention is called to this postulate. Its application is best illustrated by a concrete example. Given any di-reactive molecule (A_0) which is bound to another di-reactive molecule (B_0) through one of its primary valence bonds—

$$—(A_0)—(B_0)—$$

according to this postulate, it does not necessarily follow that the second reactive primary valence bond of molecule A_0 will react with the second primary valence bond of molecule B_0. It may do so, in which case further reactivity ceases:

$$(A_0)=(B_0)$$

However, there is also the chance that the second primary valence bond of A_0 will react with another B molecule, thus:

$$—(B_1)—(A_0)—(B_0)—$$

or with a primary valence bond in a group of A and B molecules that have already united, e. g.:

$$—(A,B)—(A_0)—(B_0)—$$

It is this random bonding of poly-reactive molecules that is responsible for the heterogeneity, polymeric complexity, and colloidal properties of high polymers.

Postulate 2 states that in high-polymer formation the reaction should proceed rapidly at first, then more slowly, according to the decrease in the number of effective contacts. At the same time as the molecular complexity increases, the viscosity should increase slowly at first, then more and more rapidly, a prediction substantiated by kinetic studies on phenol-aldehyde resins (*18*) and glyceryl phthalate (*15*).

Postulate 2 further leads to the conclusion that when the reaction activity is (2,2) chain molecules will form. Reference to Figure 2 will help to make this more obvious. If, however, the reactivity is (2,3) or greater, presumably branching, intertwining molecules will form. With such a structure ready gelation can be expected, while in the case of the simpler chain molecules—e. g., of the (2,2) type—gelation would be less probable. The tables, particularly Table III, indicate that such is the case.

This conclusion regarding the structure of the various types of high polymers has been sub-

Table IV—Effect of Varying Reactivity of Alcohol in Chinawood Oil Acid Esters (9)

Ester	Properties
Methyl, Ethyl, Amyl, Cyclohexyl, Methylcyclohexyl	Do not jell by heating at 300° C., viscosity increases slightly
Glycol	After ½ hour at 300° C. not jelled; thickens
Monoglyceride, Diglyceride	Jells by heating above 250° C.; some re-esterification occurs to form triglyceride and split off glycerol
Synthetic triglyceride	Jells as raw Chinawood oil

Table V—Effect of Varying Reactivity of Acid in Fatty Acid Esters (Alcohol: glycerol)

Acid	Potential Reactivity	Type of Fatty Oil	Remarks
Stearic	0	Solid fat	Tristearin, pure compound
Oleic	2	Heat-non-convertible	Thickened by heat; oxygen does not jell
Linoleic	4	Heat-convertible, element-convertible	Easily jelled; oxidizes without difficulty
Linolenic	6	Heat-convertible, element-convertible	Very quickly jelled and oxidized
Eleostearic	6	Heat-convertible, element-convertible	Jells quickly either by heat or oxygen

Table VI—Effect of Varying Reactivity of Acid in Heat-Convertible Alkyd Resins (13)

Acid	Reactivity Acid	Reactivity Glycerol	Flow Point* ° C.	Remarks
Benzoic	1	3		Simple esters, no resin
Phthalic	2	3	110-115	Hard, glassy, clear
Acetic	1	3		Simple esters, no resin
Succinic	2	3		Medium hard, flexible
Citric	3	3	60-80	Hard, brittle resin
Maleic	3	3	90-100	Hard, tough resin

*Taken just prior to conversion.

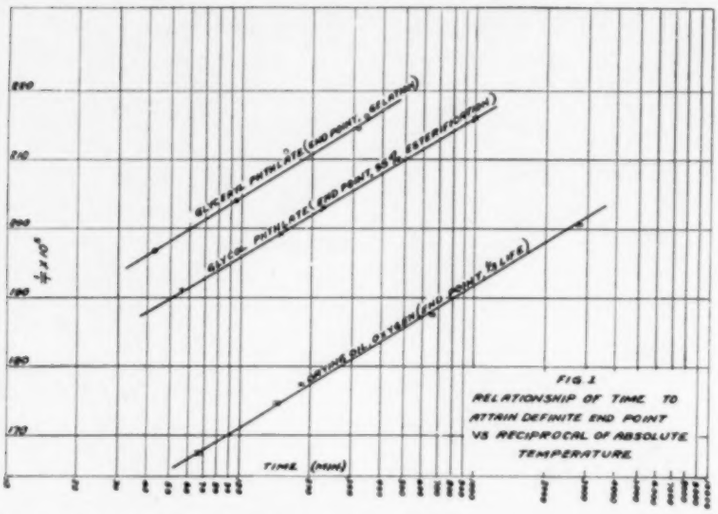

GLYCERYL PHTHALATE (END POINT, 85% ESTERIFICATION)
GLYCOL PHTHALATE (END POINT, 85% ESTERIFICATION)
DRYING OIL OXAZOL (END POINT, GELS)
TIME (MIN.)

FIG. 1
RELATIONSHIP OF TIME TO ATTAIN DEFINITE END POINT VS RECIPROCAL OF ABSOLUTE TEMPERATURE

Table VII—Effect of Varying Reactivity of Alcohol (Glycerol) in Alkyd Resins

Alcohol	Reactivity Acid	Alcohol Reactivity	Type of Resin	Flow Point °C	Water Resistance	Remarks
Methyl	2	1	.....		Insoluble	No resin, pure compound
Ethylene glycol	2	2	Heat-non-convertible	80-85	Excellent	Hard, glassy resin
Propylene glycol	2	2	Heat-non-convertible	70-80	Excellent	Hard resin
Diethylene glycol	2	2	Heat-non-convertible	20	Excellent	Balsam
Glycerol	2	2	Heat-convertible	110-115*	Fair	Hard, glassy resin
Mannitol	2	2	Heat-convertible	117*	Poor	Hard, opaque resin

*Flow point taken just prior to conversion.

stantiated by x-ray investigations. The (2,2) type polymers—cellulose, rubber, the polyoxymethylenes, the glycol poly acid esters—have consistently indicated a pseudo-crystalline or fibrous structure. Moreover, the (2,3) or greater type polymers—glyceryl phthalate, Bakelite, etc.—have shown only an amorphous structure.

Postulate 2 also leads to an interesting suggestion regarding the oxidation of drying oils, which, although hardly bearing on synthetic resins, is of sufficient general interest to warrant mention. From the same considerations as have just been given, the development during oxidation of the well-recognized colloidal properties of drying oils is doubtless due to the direactivity of oxygen and the poly-reactivity of the oils, the principal reaction being the aggregation of the oil molecules through the agency of oxygen linkages.

Postulate 3—From a practical standpoint there is usually more interest in the properties of high polymers than in the theory of their formation. In this connection Postulate 3 is useful in that the prediction of physical properties is possible. Probably the best illustration of Postulate 3 is obtained by examining the variation in the properties of the glycol - phthalate resins given in Table VII.

This postulate predicts that if the distance between the reactive molecules in a polymer is increased, a softer and lower melting product should result. This is what is observed when the ethylene glycol, and diethylene glycol resins are prepared.

On the other hand, if the number of reactive bonds per-molecular length is increased, the separate parts of the polymeric molecules would be more rigidly and compactly held in position, and hence one would predict an increase in flow point. Such is the case when we compare the ethylene glycol, glycerol, and mannitol resins. The cause of the decrease in water resistance is undoubtedly due to the presence of uncombined hydroxyl groups which are necessarily more numerous the greater the reactivity of the alchol molecule, as earlier gelation blocks their combination.

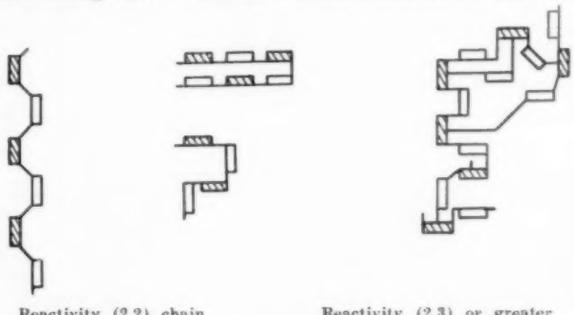
Application

A practical application of these postulates is illustrated by the results of the following experimental attempts to produce synthetic resins from phenolphthalein, glycerol, and formaldehyde:

PHENOLPHTHALEIN AND FORMALDEHYDE — The essentials necessary for a very heterogeneous linking of the molecules are present. A resin similar to Bakelite resulted.

PHENOLPHTHALEIN AND GLYCEROL—An ester, ether, or both are possible. As the phenolphthalein molecule is relatively large, the interaction should be slow and the product soft. A clear viscous liquid resulted.

PHENOLPHTHALEIN, GLYCEROL, FORMALDEHYDE—As the reactions discussed in the first two cases would both occur, a resin similar to Bakelite, but softer and with less tendency to become infusible, should result. A resin of these characteristics formed.



Reactivity (2,2) chain formation

Reactivity (2,3) or greater intertwining formation

Figure 2

(*Continued on page 603*)

World's Recent Progress in Synthetic Resins

A complete and condensed account of patents from the most important industrial countries

By Dr. Aladin

The patents that are listed here are all of recent origin and disclose the progress realized throughout the civilized world in this field. The dates, except in case of U. S. patents, are those of application. There will be a total of over 495 patents in this review. Publication began in April, 1929.

(Continued from September Issue)

XIX. Various Synthetic Resins

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of Invention
470	U. S. P. 1,537,572	Erdoel u. Kohleverwertung A.-G. (F. Zernick)	Preparation of synthetic resins and waxes.	Light colored hard resins are obtained by preparing from distilled naphthenic acids salts of one or two materials, which salts are then dried at high temperatures. If solid solvents, such as paraffin or waxes are added, the final products will have a wax-like consistency.
471	U. S. P. 1,618,209	Commercial Solvents Corp. (E. R. Littmann)	Preparation of a synthetic resin.	The resin consists of heavy-metal salts (such as of copper, iron or zinc etc.) of a monoalkyl or monoaryl ester of 3- or 4-nitrophthalic acid.
472	Can. P. 256,557	Konsortium für elektrochemische Industrie	Production of condensation and polymerization products from acetylene.	Acetylene is allowed to act in the presence of mercury of aluminum upon quite a variety of different organic substances. The presence of acid diluents often acts as an acellerator for the reaction. The products resemble cuprene bodies, and may be used as a substitute for cork. Some of the reaction products are resinous and suitable for lacquers and as binders in plastics.
473	German P. 449,275 Frdl. XV, 1174	Siemens & Halske A.-G.	Preparation of shellac-like substances.	Mixtures of hydroxy-acids of aliphatic nature or of hydro-aromatic nature are heated either at ordinary or reduced pressure, if desired also while passing an inert gas over the same; the reaction being preferably carried out in the presence of an esterifying catalyst. Finally waxes or esters of higher fatty acid may be added to the products.
474	German P. 451,116	I. G. Farbenindustrie A.-G. (W. Pungs)	Preparation of an artificial resin.	Oxidation products of the paraffins are treated while in solution in carbon tetrachloride with chlorine, care being taken to remove the non-oxidized hydrocarbons before adding the chlorine. The products, which may have a chlorine content of about 55% form yellow resins, soluble in ether, acetone etc., and form very hard coatings when used as lacquers.
475	German P. 468,587	Oester.-Alpine Montanges.	Preparation of resinous masses.	Sulfite cellulose waste liquors are mixed with sodium silicate, and the mixture is further mixed with fillers and dried.
476	Brit. P. 228,157	Konsortium für elektrochem. Industrie	Preparation of acetylene condensation products.	See Canadian P. 256,557 (No. 472)
477	Brit. P. 250,265	Commercial Solvents Corp.	Preparation of synthetic resins.	This resin consists of the zinc, iron or lead salts of mono-alkyl esters of phthalic acid, such as of mono-ethyl phthalate. The zinc salt, for example is a solid transparent brittle mass, melting at 150°C., but insoluble in organic solvents and in water.

PLASTIC MOLDING

Producers of the finest
in Molded Parts for
thirty-eight years

Shaw Insulator Co.

Irvington, N. J.

SHAW

Expert Bakelite Molding Requires Perfect Dies, Modern Equipment, Skilled Labor

RECTO combines these with a knowledge of molding and an understanding of the correct way to apply this knowledge to your product.

"Remember Recto Does It---Better"

Recto Manufacturing Company

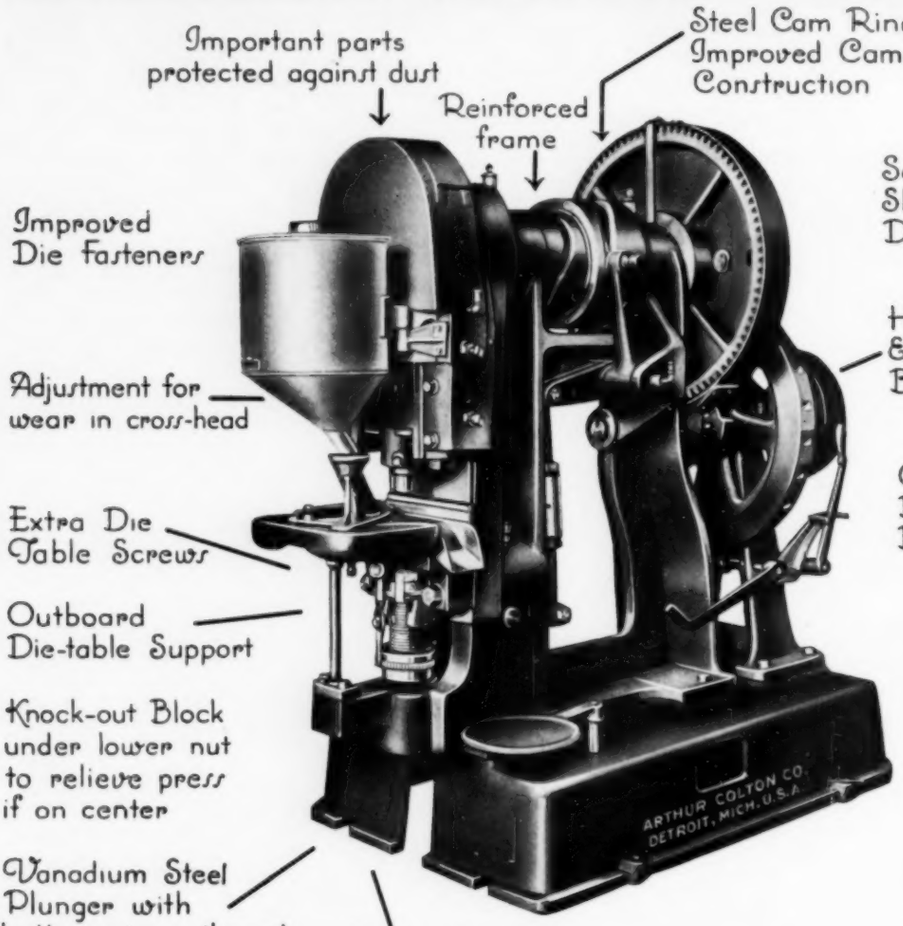
APPLETON STREET **CINCINNATI, OHIO**

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of Invention
478	Brit. P. 264,550	E. Hope	Preparation of glass-like condensation products from itaconic acid esters.	The polymerization of the itaconic acid esters is acellerated by the presence of acid, and delayed by alkalies. The intermediate products are still plastic and can be molded, whereupon by further heating the products can be rendered infusible.
479	Brit. P. 269,973	Griffiths Brothers & Co., London, Ltd., and R. P. L. Britton	Preparation of resinous products.	Aromatic saturated or unsaturated alcohols, such as benzyl alcohol, cinammic alcohol, etc., either alone or in admixture with aromatic hydrocarbons such as naphthalene, phenanthrene, anthracene and the like, are condensed with formaldehyde or one of its polymers, acids forming the condensing agent. The resins, after purification either by washing or by means of steam distillation, are useful in the preparation of varnishes and similar coating-compositions.
480	Brit. P. 278,390	I. G. Farbenindustrie A.-G.	Preparation of condensation products from urea and alcohols or ketones.	The components are heated under pressure in the presence of suitable catalysts. Urea when thus condensed with benzyl alcohol or with glycerol first yields urethanes, which on further treatment pass over into oily or resinous condensation products.
481	Brit. P. 287,095	I. G. Farbenindustrie A.-G.	Preparation of resinous or of oily condensation products.	Urea, thiourea or their derivatives (for instance acetylurea) are condensed by heating with substances having an alcohol group, (such as diacetin, butyleneglycol, methyl-cyclo-hexanol or ketones such as cyclohexanone) in the presence of aromatic or hydroaromatic amines or acidamides having at least one free hydrogen in the amido group, for example such substances as benzylamide, acetanilide, toluene-sulfonamide, etc. The products are particularly useful as cellulose ester plasticizers.
482	Brit. P. 290,192	I. G. Farbenindustrie A.-G.	Preparation of resinous condensation products.	Urea or thiourea or their derivatives are condensed with alcohols or with ketones and with amino-compounds, the reaction being carried out in the presence of metals. For example, glycol, urea and paratoluenesulfonamide are heated together, and after reaction and when cooled are treated with sodium amalgam.
483	Brit. P. 290,327	O. Arnot	Preparation of resinous bodies.	Condensation products are prepared by condensing aldehyde such as formaldehyde with substances containing amino-groups such as urea, thiourea, aniline, etc., plus phenolic substances such as phenols, salicylic acid, etc., or with organic acids such as lactic acid, citric acid, tartaric acid, succinic acid, benzoic acid and colophony (rosin).
484	French P. 612,976	Commercial Solvents Corp.	Artificial Resins.	See Brit. P. 250,265. (No. 477)
485	Swiss P. 118,005	Consortium für elektrochemische Industrie	Preparation of acetylene condensation products.	See Can. P. 256,557. (No. 472)

XX. Miscellaneous Synthetic Products

486	German P. 462,200	I. G. Farbenindustrie A. G. (J. Rath and E. Hoygt)	Preparation of reserve-color effects.	Synthetic resins that are resistant to the action of alkalies, but which are soluble in acids or in organic solvents, are used to reserve those portions of the fabrics which it is desired to maintain undyed.

A NEW IMPROVED PREFORMING PRESS


Important parts protected against dust
Steel Cam Rings Improved Cam Construction
Reinforced frame
Safety Shearing Device
Improved Die Fasteners
Heavier Ejecting arm Brackets
Adjustment for wear in cross-head
Convenient Brake and Belt Shifter
Extra Die Table Screws
Outboard Die-table Support
Knock-out Block under lower nut to relieve press if on center
Vanadium Steel Plunger with buttress type thread
Accessibility for installing core rods
ARTHUR COLTON CO. DETROIT, MICH. U.S.A.

This is our new 5½ Tablet Machine making tablets up to 3" in diameter and having a depth of fill of 2⅛". The improvements above, with the use of a solid steel frame, insure unusually satisfactory performance.

We make a complete line of preforming machines: single punch, multiple or rotary style.

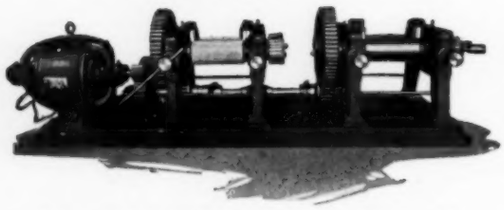
Write for literature.

COLTON DETROIT

ARTHUR COLTON COMPANY

DETROIT MICHIGAN

National Laboratory Mixing Mills



Used extensively by manufacturers of rubber, chemical, and plastic products

National Rubber Machinery Co., Akron, Ohio

—PYROXYLIN PLASTICS—

NIXONOID PEARL ESSENCE

NEW ENGLAND DISTRIBUTORS SPARTAN AIRPLANES

Open and Cabin Ships

E. W. Wiggins & Co., Inc.

Leominster, Mass.

SHEETS RODS TUBES

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of Invention
487	Brit. P. 248,007	I. G. Farbenindustrie A.-G. (Farbwerke Höchst)	Dying mixtures of different kinds of textiles in different colors.	In dyeing mixed fabrics, the animal fibers therein can be kept undyed by adding to the dyeing bath aromatic sulfo-acids which, for instance have been prepared from benzyl chloride which has been condensed with the sodium salt of a synthetic resin made from phenol and acetaldehyde.
488	Brit. P. 275,795	H. Friedländer	Preparation of plastic masses containing fibers.	Textile fibers, in the form of a felt, are impregnated or mixed with synthetic resins derived from phenols, urea, phenanthrene, anthracene, etc., and are molded subsequently under heat and pressure.
489	Brit. P. 278,684	I. G. Farbenindustrie A.-G.	Diminishing the ability of regenerated cellulose to swell.	Regenerated cellulose, which may or may not first have been dried, is treated with an aqueous solution of an artificial resin or of raw material capable of forming one; the coated cellulose then being heated to harden the resin or being treated with formaldehyde.
490	Brit. P. 284,232	British Thomson-Houston Co., Ltd. (H. L. Watson)	Preparation of plastic masses.	Layers of cellulose, or of felt, are impregnated with natural shellac like resins, or with synthetic resins of the "Bakelite" or "Glyptal" type, and are then molded under heat and pressure. The products are used for electrical insulation.
491	Brit. P. 289,630	British Dyestuffs Corp., Ltd., (E. Chapman)	Preparation of a fire-foam extinguishing mass.	The fire-extinguishing composition contains sulfonated derivatives of condensation products of the aldehyde-phenol or aldehyde-naphthalene type.
492	Brit. P. 291,443	Tootal Broadhurst Lee Co., Ltd. (R. P. Foulds, J. T. Marsh, F. C. Wood, A. Boffey and J. Tankard)	Saturating fibrous materials with artificial resins.	The artificial resin is formed in the fibrous material by saturating the latter with the necessary raw materials in the presence of alkaline condensing agents. Phenolic resins, for instance, are formed. The product is subsequently hardened under heat and pressure.
493	Brit. P. 297,463	I. G. Farbenindustrie A.-G.	Diminishing the ability of cellulose to swell.	Cellulose is treated with an aqueous, or alkaline solution of a synthetic resin or with the necessary raw materials to form one; the resulting product being hardened by heat or by treatment with formaldehyde.
494	French P. 639,184	P. Doremieux and L. Berly	Printing plate made of synthetic resins and the like.	The usual electrotypes are replaced by printing plates made from synthetic resins that have been molded under heat and pressure (Note: see the many U. S. P. by Novotny on the same subject; see article by C. W. Rivise on "Resinoids in the Printing Art; Plastics 1930).
495	Swiss P. 125,012	Soc. for Chem. Industry	Electric method for removing condensing agents from condensation products.	The condensing agents used in the preparation of the resins are removed by electrolysis.
496 (=98) P. 508 Sept. 1929	Brit. P. 283,002	G. Petron	Preparation of Phenol Resins.	See F. P. 628,130 (No. 102).
497 (=108) P. 508 Sept. 1929	U. S. P. 1,679,312	Diamond State Fibre Co. G. L. Landt	Preparation of artificial Resins.	Xylenols or mixtures thereof are condensed with formaldehyde or its polymers; or with glycerol or acetaldehyde, either with or without catalysts. The resin can be hardened with hexamethylenetetramine or anhydroformaldehyde-aniline, etc. under pressure.
498	The second No. 110, on p. 509, Sept. 1929 should be No. 111			
499 (=132) Nov. 1929 P. 628	Swiss P. 122,362	Bakelite Ges. m. b. H.	Phenol Resins.	See Brit. P. 247,956 (No. 121).

Index to Patents in the Review by Dr. Aladin

United States Patents

Patent No.	Serial No.	Patent No.	Serial No.
1458543	273	1654275	277
1472353	78	1654856	237
1489744	412	1658281	47
1500844	141	1658359	278
1519322	142	1658597	279
1519323	390	1658828	106
1537572	470	1659151	251
1557519	401	1659152	252
1557730	143	1660094	442
1560346	144	1660403	1
1564774	145	1663160	405
1566817	4	1663183	414
1570469	230	1665233	244
1582056	5	1665234	245
1583014	448	1665235	246
1586803	221	1665236	247
1588439	402	1665237	248
1596971	240	1667189	415
1600113	241	1667197	416
1602249	146	1667198	417
1606943	133	1667199	418
1607283	40	1667200	419
1609367	105	1667675	135
1609506	134	1667872	11
1613724	147	1668444	394
1613894	148	1668445	395
1614025	41	1669674	48
1614171	42	1669831	2
1614172	43	1671228	233
1616741	403	1671596	280
1618209	471	1672538	152
1619692	429	1672848	281
1619758	430	1673239	431
1623901	449	1673797	153
1624082	44	1673803	450
1624638	45	1673804	451
1625283	274	1673805	452
1625852	242	1673806	453
1630365	46	1673807	454
1632113	79	1673808	455
1633337	275	1674199	282
1633976	80	1676543	283
1634969	413	1677417	12
1636596	404	1678024	284
1637487	149	1678105	420
1637512	6	1678107	107
1638342	150	1678108	136
1639957	249	1679246	285
1640562	81	1679312	497
1640899	250	1679322	13
1642078	391	1680408	83
1642079	392	1681155	49
1643447	82	1681368	117
1645226	7	1681369	118
1645693	116	1682913	234
1645848	276	1682914	406
1648852	393	1683701	50
1648858	8	1684142	51
1650109	151	1684755	154
1650899	9	1684868	215
1653302	10		

Canadian Patents

Patent No.	Serial No.	Patent No.	Serial No.
237679	84	261953	157
240528	85	261954	158
254674	286	262135	54
256557	472	262136	87
256883	155	262194	88
258137	396	262391	159
258608	86	262399	422
258609	14	262930	89
258977	52	262979	432
258978	53	263373	15
260384	156	265519	287
261754	421	265674	160

French Patents

Patent No.	Serial No.	Patent No.	Serial No.
542971	328	618991	338
562320	329	619342	339
563777		620144	192
730787	99	620169	71
578444	239	621736	193
591920	100	622369	138
593442	384	623087	340
594932	26	623535	194
596071	68	623983	341
596072	69	624441	342
596339	462	624493	227
596392	27	625145	343
602318	330	628130	102
603625	331	628650	266
603875	332	629644	195
604198		630086	72
731805	440	637645	385
605736	28	632526	344
607655	112	633540	196
609850		633541	197
731708	187	634136	228
610012	125	634925	30
610013	126	635399	198
610107	70	636219	345
610108	101	636348	199
611264	188	636606	399
611271	333	637051	346
611973	334	637318	347
612297	398	637721	200
612298	127	638084	427
731625	128	638121	428
612306	263	638275	441
612758	264	638887	73
612785	265	639184	494
612976	484	640364	229
615346	335	641349	201
615713	29	641420	348
616048	336	641778	202
616463	428	643438	74
616495	337	643439	103
616505	189	643766	400
616670	446	644015	220
617424	190	644075	267
618742	191		

German Patents

Patent No.	Serial No.	Patent No.	Serial No.
319011	216	446562	223
363291	217	446707	218
410012	235	446998	291
420918	456	446999	231
423032	109	447000	466
424074	110	448201	292
427607	236	448752	459
429043	90	448427	243
431146	222	448582	433
432485	161	449115	224
434419	457	449275	473
436445	17	449276	57
436523	407	451116	474
436779	18	451734	253
437047	162	452009	254
437533	288	453276	255
437612	111	454307	219
437646	289	456082	293
439962	55	456820	467
440003	443	456931	19
441191	458	468105	58
441708	91	459310	3
442211	92	462200	486
442361	56	463774	434
443454	290	466429	163
444109	465	468587	475

British Patents

Patent No.	Serial No.	Patent No.	Serial No.
193420	294	266752	313
200262	164	267736	24
201916	444	267901	63
206512	295	269973	479
213567	296	270433	258
214242	238	271037	314
227468	93	271264	315
228157	476	272478	171
230861	20	273756	172
231501	21	274146	397
232958	408	274155	259
238904	297	274333	173
240840	298	274355	174
243556	460	274581	123
246126	299	275011	175
246127	300	275725	260
246833	119	275795	485
246834	129	276427	64
247282	165	276440	176
247956	121	278390	480
248007	487	278460	177
248477	301	278684	489
248726	122	278801	380
248729	302	280520	65
249101	303	281537	66
250265	477	281717	316
250942	435	281742	437
250949	423	281993	317
252394	424	282786	381
252715	445	282810	438
252519	436	283002	496
254703	22	283868	178
254888	94	283965	261
255516	59	284232	490
255692	95	284272	318
255837	225	284348	439
256248	304	284589	262
256394	96	285058	179
256711	305	285554	382
258289	306	286305	180
258950	378	287095	481
259030	461	287177	319
259046	60	287568	320
259252	166	288303	181
259950	374	288346	321
260288	307	289630	491
260319	167	290192	482
261029	308	290327	483
261406	226	291366	322
261409	309	291473	492
261447	23	291474	182
261472	61	291477	183
261522	62	291712	323
262148	310	292595	324
262818	379	292636	184
263674	168	292637	185
264466	375	292646	425
264550	478	293436	67
264601	137	293872	325
264674	256	294253	326
265033	97	294254	327
265334	169	294551	383
265566	170	295228	186
266028	311	295442	25
266358	257	296512	124
266389	312	297463	493

Holland Patents

Patent No.	Serial No.	Patent No.	Serial No.
14285	349	16542	203
15567	350	16543	204

Norwegian Patents

Patent No.	Serial No.	Patent No.	Serial No.
40498	468	44578	205
41228	75		

(Continued on page 601)

Italian Plastic Production and Trade

Commerce Reports state that 1929 production reached 1,500 Metric Tons. Last year's Foreign Trade valued at Million and Half Dollars

By Elizabeth Humes
Trade Commissioner, Rome, Italy

AT the end o the 3-year period, 1927 to 1929, inclusive, the total value of the Italian foreign trade in plastics had advanced 40 per cent to the record figure of $1,500,000 in 1929. In this advance imports participated to the extent of $339,368, whereas the increase in exports was only a little over a third ($117,514) of this figure. Of the total foreign trade, imports account for about four-fifths of the total value. The total 1929 production of plastics is estimated at 1,500 metric tons, as compared with 66 tons in 1921.

United States Secures Larger Participation in Italian Import Trade

In Italian foreign-trade statistics all plastic materials are grouped together, and therefore it is not possible to ascertain the quantity of each plastic imported. The following Table I shows the quantity and value of imports and exports according to the data available.

Germany is the principal source of supply, as well as one of the leading markets. Although United States participation in the Italian import trade in plastics is small, it is certain that figures for 1929 will show an appreciable growth. United States statistics record an advance in exports of pyroxylin plastics to Italy from only $6,794 worth in 1927 to $35,706 worth in 1929.

Statistics available for Italian trade in plastics in 1927 give some idea of the distribution by countries, see Table II.

Developments in Italian Plastics Industry

Developments in Italy with regard to individual plastic materials are summarized in the following paragraphs:

Pyroxylin Plastics — The manufacture of celluloid was begun in Italy in 1924. There is now one company, the Societa Italiana Celluloide, producing celluloid at Castiglione Olona. The plant originally was equipped to produce 600 tons annually, but the actual output did not reach that figure until 1927. At present the annual capacity is being extended to approximately 1,000 tons. When operating at normal about 200 workers are employed. Celluloid is produced in rods, tubes, and sheets. The quality is excellent, but the output is not yet sufficient to cover domestic consumption, and imports continue, principally from Germany. At the same time, Italian celluloid is beginning to find an outlet into foreign markets.

Cellosite — Cellosite is the trade name of a plastic material similar to cellophane, on an acetyl-cellulose base. It is manufactured in a plant (belonging to the firm of Eltore Rossi) near Milan, equipped with the most modern machinery. Cellosite is produced in the form of thin transparent sheets, clear or colored, gilded or silvered, and is used for wrapping toilet goods, novelties, and small articles for retail trade; for making transparent boxes, envelopes, and book covers; and as a backing for films. It is also being used as a substitute for celluloid in various fields, owing to its great transparency and to the fact that it is noninflammable. Cellosite is a comparatively new item for Italy and no production figures are yet available.

Italian Bakelite

Bakelite—Bakelite is made in Italy according to the Baekeland patents by the Societa Italiana Bakelite, of Milan. Until recently true Bakelite was produced in Italy in one plant at Farraina, near Savona, but now manufacture of a similar product has started at Genoa. These products are sold under such trade names as Fimielite, Super-

Table I

Italian foreign trade in pyroxylin plastics, casein plastics, phenolic resin, and similar products

Year, and total quantity and value	Waste—fit only for refinishing	In bulk	In rods and tubes	In sheets and leaves	In forms not specified for industrial purposes	For other uses
IMPORTS						
1927:						
Quintals	397	407	800	3,225	87	732
Lire	324,625	404,627	1,927,313	9,733,566	290,462	6,454,208
1928:						
Quintals	597	816	822	3,745	185	1,042
Lire	532,055	904,954	1,886,337	9,924,799	673,952	8,859,715
1929:						
Quintals	574	2,296	1,154	4,573	252	855
Lire	293,391	2,635,027	2,800,767	12,300,117	1,047,110	6,845,753
EXPORTS						
1927						
Quintals	244	.....	314	490	156	265
Lire	149,859	.....	621,489	1,156,721	479,576	1,249,850
1928:						
Quintals	169	.....	279	711	192	394
Lire	115,118	.....	440,255	1,559,691	518,686	1,883,468
1929:						
Quintals	73	.....	170	1,669	240	433
Lire	51,650	.....	271,050	3,348,230	1,499,995	1,836,848

NOTE:—Lira averaged $0.0516 in 1927, $0.0526 in 1928, and $0.0523 in 1929.

ACCURACY *first*

and finally . . . CONSTANT UNIFORMITY

FIRST consideration in the perfected manufacture of ARC molded parts is for complete accuracy in following out the precise specifications of the purchaser—when the standard of accuracy has been attained in the initial piece, hundreds, thousands, or millions of similar pieces follow in perfect uniformity. It is this efficient relation between accuracy and uniformity that has given the American Record Corporation a reputation for superiority—and has made manufacturers everywhere insist upon ARC custom-moldings for complete and genuine satisfaction.

Top illustration: A bottle cap for process cleaner. Vent hole comes directly under valve seat, insuring accurate control of liquid flow.

ARC

Center illustration: This is a cock handle for operating gas jets . . . showing flat "on-metal" part parallel with wings of handle. Center of hole is accurately located from end of shank of handle.

ARC

Bottom illustration: Handle for utility drawer on a gas range—note that it is of a new type, modern tear-drop design. Phenolic from which it is molded is beautifully mottled.

The identifying trade-mark of superior molded parts for half a century.

NEW YORK
50 Union Square

CHICAGO
645 Washington Blvd.

CLEVELAND
4900 Euclid Bldg.

DETROIT
145 Eastlawn Ave.

American Record Corporation

Molded Parts *of* PHENOLIC *for* Every Purpose
BAKELITE DURITE LACANITE DUREZ

Principal Offices and Plants: SCRANTON, PA.

Table II

Distribution of Italian foreign trade in pyroxylin plastics, casein plastics, phenolic resins, and similar products in 1927

Countries of origin or destination	Waste—fit only for refinishing	In bulk	In rods and tubes	In sheets and leaves	In forms not specified for industrial purposes	For other uses
IMPORTS:	Quintals	Quintals	Quintals	Quintals	Quintals	Quintals
France	34	47	39	355	6	200
Germany	318	211	660	1,729	38	427
United Kingdom	16	....	1	284	2	13
Switzerland	24	148	84	786	15	8
Other	5	1	16	71	26	84
Total	397	407	800	3,225	87	732
Exports:						
France	90	....	33	161	14	9
Germany	34	....	7	126	29	9
Switzerland	115	....		1	....	38
Other	5	....	274	211	113	214
Total	244	....	314	499	156	265

isolite, and Sigaleos. They are used principally for the manufacture of noiseless bearings, insulating materials, molded pieces, and similar equipment. In addition, there are produced in Italy Bakelite resins, soluble in alcohol and in oil; Bakelite lacquers and enamels; a Bakelite imitation of amber, tortoise shell, and mother of pearl; and bakelite cement for electric bulbs. The Societa Annonima Bordoni of Turin recently absorbed the Societa Anonima Ivra, which produces a synthetic resin similar to Bakelite under the trade name of "Ivrite."

Domestic production of solid Bakelite, including the so-called ivrite and xilite, rose from 34 tons in 1923 to 300 in 1927. The demand for this plastic is continually expanding and production may be expected to increase.

Casein Plastics—Zoolite and Galakerite are casein plastics similar to galalith. Zoolite is manufactured at Codogno, in the Province of Milan, in plants of the Societa Polenghi Lombardo of Lodi, which has a capital of 25,000,000 lire, and is connected with the largest Italian manufacturers and exporters of dairy products. The machinery and equipment of the plants recently have been renovated and their capacity doubled. Two specialties of the Italian zoolite industry are piano keys and transparent sheets for combs. Zoolite is produced in sheets, rods, and tubes. It is also treated in sheets in imitation of tortoise shell, marble, ebony, ivory, and mother of pearl.

The production of galakerite was begun in 1923 in a plant of the Societa Italiana Galakerite, of Milan, capitalized at 1,200,000 lire.

Other plastics worthy of note are proteolite, produced by the Industria Italiana della Proteolite, Milan, and globerite, which is made at Milan by the Societa Industria Globerite. The latter product is produced for the manufacture of buttons.

Corozite—An important plastic material is known as corozite. It is manufactured at Gorlago (Bergamo) by the Societa Anonima Prodotti Italiana Corozite in a modernly equipped plant which began operations in 1925. The chief uses are in the manufacture of buttons and of molded articles for the electrotechnical industries. Corozite is very tough, is not inflammable, and may be tinted in any color. The plant in the Province of Bergamo has a productive capacity of about 6,000 gross of buttons daily.

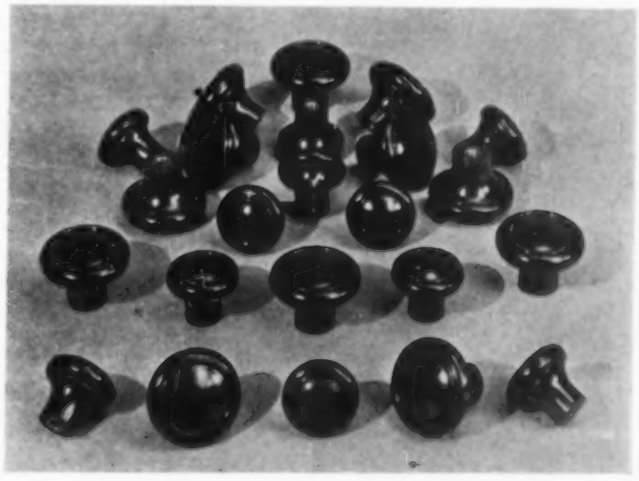
Manufactured Articles

The various industries manufacturing articles from plastics in Italy are older than those producing the raw materials. In 1927 there were 113 factories making combs, hairpins, and similar articles, which used celluloid and other plastics. This industry employs about 2,200 workers and is subdivided among numerous small factories employing not more than 10 workers. Only 6 factories employ over 100 workers and 7 from 50 to 100 workers. Other industries using plastic materials, particularly celluloid, are manufacturers of umbrella handles, purse clasps, brushes, toilet articles, and spectacle rims.

News

ON September 1st, Paul A. Dillman, formerly Advertising Manager of the Du Pont Viscoloid Company, 330 Fifth Avenue, will become Advertising Manager of the Du Pont Cellophane Company with headquarters at 2 Park Avenue.

Mr. Reggie Ellis will join the Advertising and Sales Service Department of the Du Pont Viscoloid Company to take over Mr. Dillman's former work.



Drawer knobs of Bakelite molded in wood effects will be welcomed by furniture manufacturers who know the cost reduction made by using knobs completely finished in one unit molding operation.

American Insulator Corporation

NEW FREEDOM, PA.

PLASTIC MOLDING

COLD MOLDED AND PHENOLIC PRODUCTS

BEETLE
LUMARITH
BRAYLITE

Sales Offices:

N. Y.: Graybar Building
Chicago: 9 S. Clinton St.
Detroit: General Motors Bldg.
Bridgeport, Conn.: 421 Meigs Bldg.

What is Patentable

(*Continued from page 667*)

defined by means of examples taken from litigated patents. Wherever possible the examples will be limited to the plastics art. This policy will also be followed in the rest of the paper which goes thoroughly into the question of what constitutes invention.

Recently Congress extended the benefits of the Patent laws to originators of new varieties of plants or trees by granting to them a seventeen year monoply on the reproduction of the new variety of asexual means. This new form of patent protection should greatly encourage the many workers who are seeking to increase the yield of rubber and cellulose from existing species of trees by means of hybridization. See Dr. McKee's article on the subject in the July 1930 issue of Cellulose.

Art or Process

The term "art" is commonly considered synonymous with the word "process" and may be best defined as "an operation performed by rule to produce a desired result by means not solely mechanical."

A patentable process may consist of one or more steps. An excellent example of a one-step process is that defined in a claim of Weston's Reissue Patent No. 13,730, which reads as follows:

"The method herein described of manufacturing paper having a thinned portion, which consists in removing from the web at the portion to be thinned along a definite line, some of the material by the application of air pressure thereto."

This claim was held valid in the decision of the Weston Co. vs. L. L. Brown Co. reported in 20 Fed. Rep. (2nd) 183.

A splendid example of a process of more than one stop or operation is disclosed in the Dyer Patent 483,646 held valid in the case of Mica Insulator Co. vs. Union Mica Co. 137 Fed. Rep. 928. A claim of this patent is as follows:

"The herein descibed method of building up electrically insulating mica sheets, consisting in varnishing a foundation plate, placing mica scales thereon while the varnish is still wet or soft with their edges overlapping, varnishing the mica sheet, thus forming a second and a third, etc., layer of mica in a similar manner until the required thickness of mica sheets is obtained and chilling the sheet while rigidly held in a curved position."

It will be noted that in the Weston patent the mechanism for carrying out the process was old. There was certainly nothing new in the paper-making machine nor in the air hose utilized in creating the air pressure for removing some of the stock along the desired line. Likewise, the means utilized by Dyer for varnishing the mica sheets was old. In fact, anyone skilled in the particular art can without exercising any inventive ingenuity devise other mechanisms capable of carrying out the steps of the processes. Some of the operations can even be performed by means of simple tools or by hand.

Hence it may be stated as a general rule that the tools or apparatus utilized in carrying out a process are of minor importance as far as the patentability of the process is concerned. In fact the steps or operations themselves should be as far as possible independent of the form or kind of tools used. This is indicated in the definition that has been given of the term "art".

True Processes

If the steps of the process are not independent of the form or kind of tools or apparatus utilized in performing them, the Courts will hold a claim covering the process invalid, as being for the mere function or mode of operating the machine. The usual test to determine whether a so-called method is a true process or the mere function or mode of operation of a machine, is whether the process can be

Our Men Know Their Jobs

A proud boast, but a true one

From our sales engineers thruout our factory organization they have been almost literally born and brought up in this industry.

Call on them to help you.

They can give you many suggestions to make a part better and cheaper molding without sacrificing your objective.

Backed by ample and complete equipment we invite the opportunity to be of service to you.

THE BOONTON MOLDING COMPANY

324 Myrtle Ave., Boonton, N. J.

New York Office, 30 Church St.

BAKELITE-DUREZ AND ALL SYNTHETIC RESINS

carried out by more than one form of machine or tool. If it can, it is a true process, otherwise, not.

It is conceivable that a process may be invented that can be carried out by means of a newly invented machine. In that case both the method and the machine may be patented, either in the same or different patents.

This was the situation in the case of Hammerschlag vs. Scamoni 7 Federal Reporter 585 involving a patent covering both a method and a machine for making waxed paper for wrapping butter, cheese, etc. The method consisted in spreading wax on one surface of the paper, heating the paper from the opposite side to spread and fuse the wax into the fabric of the paper, removing the surplus wax and polishing the wax upon the paper. The Court held that both the method and the machine utilized for carrying out steps of the process were new and entitled to patent protection.

Hand and Machine Methods

Obviously a method of doing something by machine that had previously been done by hand is not patentable, if the hand and machine methods are essentially the same. Nor is an old method performed by means of a tool patentable as a method. In both case, however, the machine or tool may be patentable.

In the case of Thropp Son's Co. vs. Seiberling 264 U. S. 320 involving Patent No. 941,962 to State for making tires by machinery, the patentee claimed that he had been the first to successfully build tire carcasses by machinery. The Supreme Court held that the method used by State consisted of the same succession of steps as had been previously performed by hand. Patentability was therefore denied to his method. The machine claims were also held invalid on the ground that the transfer from hand to power was by the usual appliances used before State's alleged invention.

Machine

A machine has been defined as "an instrument composed of one or more mechanical powers and capable when set in motion, of producing by its own operation, certain predetermined effects".

A claim for a machine held valid in the case of Keasbey & Mattison Co. vs. American Magnesia & Covering Co., 143 Fed. Rep. 490, reads:

"A machine or apparatus for making plastic tubes, having a press with a mold therein, a reservoir, a supply pipe leading from said reservoir to said mold, a pumping device for forcing tube material from said reservoir to said mold, an air chamber communicating with said supply pipe and between the pumping device and the mold, said parts being combined substantially as described".

Manufacture and Composition of Matter

The term "manufacture" is synonymous with article of manufacture and is best defined as "whatever is made by the art or industry of man, not being a machine, a composition of matter or a design".

A composition of matter may be defined as that which is formed by the intermixing of two or more substances, whether it be by chemical union, mechanical mixture or both, and whether the ingredients be fluids, solids or gases.

The difference between a machine and an article of manufacture is that a machine has a law of operation inherent within itself while an article of manufacture has no law but depends entirely upon external forces. The difference between an article of manufacture and a composition of matter is that in a composition the patentable quality resides in the novel combination of ingredients, while the patentability of an article depends upon the inherent characteristics of the article itself. It follows therefore that an article may be composed in whole or in part of a composition of matter, which in itself may be novel and form the subject matter of a patent.

A good example of an article composed of old compositions of matter is the plaster board disclosed in Patent 520,123 held valid in the case of Sackett Plaster Board Co. vs. Rutkowsky 167 Fed. Rep. 139. The claims called for a plaster board consisting of alternating layers of paper and plastic lime cement.

It must be emphasized that a patent cannot be obtained for the intermediate product of a process unless it is in commercial form. Thus, patents have been granted on gear blanks and on fusible resinous compositions suitable as varnishes and molding compositions, but a patent was refused on a gob of glass in its temporary condition while being transformed into something else.

An article is entirely independent of the machine or method by which it is made. Many articles are still made by old hand processes. If the machine or method by which the new article is made is also novel, it may be protected in the same or a separate patent. In fact, it is possible to secure patent protection on a machine, method, article and composition, if the composition be new and can be made into a new article of manufacture by performing a new series of steps by means of a new machine. Usually the invention of a new composition is followed almost immediately by many new methods of making the composition as well as new uses and applications of the new composition, many of which form the basis for valid patents for compositions, articles, methods and machines.

As an instance of this may be cited the artificial resins of the phenolplastic type. Since the pioneer work of Blumer, Luft, DeLaire, Aylsworth, Baekeland, Novotny and Redman, almost thirteen hundred patents have been issued in this

country alone on resinoids of this type including their applications and methods of applications.

As a general rule an old composition in a different state or condition may be patentable as a new composition. Of the many possible illustrations may be mentioned an artificial plastic in a solvent for use as a varnish or mixed with a filler for use as a molding composition. The case of General Bakelite Co. vs. Nikolas 225 Fed. Rep. 539 involving Patents 954,666; 1,018,385 and 1,037,719 is in point.

Improvement

An improvement is an addition to or in alteration in some already existing art, machine, manufacture or composition. It need not be better in all respects than the thing upon which it purports to be an improvement. At the present state of the arts most of the patents being applied for are but improvements on some basic patent. However, the day of generic or basic patents is not yet past.

Design

A design may be defined as that which gives a peculiar or distinctive appearance to an article of manufacture. The appearance may be the result of peculiarity of configuration, or of ornament alone, or of both conjointly, but, in whatever way produced, the new thing is the subject of a design patent. However, if the main purpose of the configuration is for mechanical utility, it cannot form the basis for a design patent. Nor can a valid design patent be gotten for a machine, no matter how much its appearance appeals to the esthetic senses. The Courts have, however, recently relaxed the rule and allowed a design patent on a concrete mixer.

This article is of considerable length and will fill more space than can be devoted to it in any one issue. It will be concluded in a later issue.

RESINOIDS IN THE PRINTING ARTS

Continued from September Issue

By Charles W. Rivise

G. S. Williamson, 1,173,907, Feb. 29., 1916. Filed May 27, 1913.

Matrix Blank and Method of Making Same

Highly absorbent material such as blotting paper is impregnated successively with a strong solution of sodium silicate and initial phenol formaldehyde condensation product, being dried between impregnations. The sheet may be impregnated several times with the condensation product. To one side is then united a sheet of sisal paper by means of sodium silicate and the other side which is to form the molding face is polished by means of talc or baryta or a smooth surface may be imparted thereto by cementing tissue or onionskin paper thereto. The plate is pressed in a mold against the type with heat after which it may further be heated by means of a "scorcher." The plate may be curved at any stage of the process, but preferably while being scorched.

The impregnation may be with the condensation product first and then with the silicate, in which case sisal paper is attached to both sides and the plate is further backed with several sheets of tough paper.

The condensation product may be made from any of the phenols or mixtures thereof.

E. E. Novotny, 1,377,509, May 10, 1921. Filed May 5, 1917

Printing Plate and Method of Making Same

One or more fibre sheets such as blotting paper or paper felt is impregnated with Bakelite or Condensite in alcohol solution, heated to drive off solvent and to partially harden the condensation product. The layers are superposed; face coatings of powdered condensation product are applied to one or both faces of assembly which is then subjected to heat and pressure in suitable mold to consolidate the assembly and to form the printing characters.

The plate may be curved before it has finally set.

E. E. Novotny, 1,377,510, May 10, 1921. Filed May 5, 1917

Matrix and Method of Making Same

Sheet of well-woven plastic matrix paper is faced with a barrier layer consisting of kaolin or China Clay or a less-absorbent paper uncoated or coated with the kaolin or China Clay, and a layer of Bakelite or Condensite is then applied. Barrier layer prevents too free absorption of phenolic condensation product by matrix paper.

Barrier layer may be omitted entirely and condensation product applied by sprinkling it on in powdered form or by rolling on in plastic form.

E. E. Novotny, 1,377,511, May 10, 1921. Filed June 1, 1917.

Printing Plate Registration Apparatus

Incidentally mentions that if the plate is of plastic material such as a phenolic product, a suitable cement such as a phenolic cement, may be interposed between the printing plate and the boss plate to insure the adherence of the latter.

E. E. Novotny, 1,377,512, May 10, 1921, Filed Oct. 29, 1917.

Composite Sheet for Making Matrices

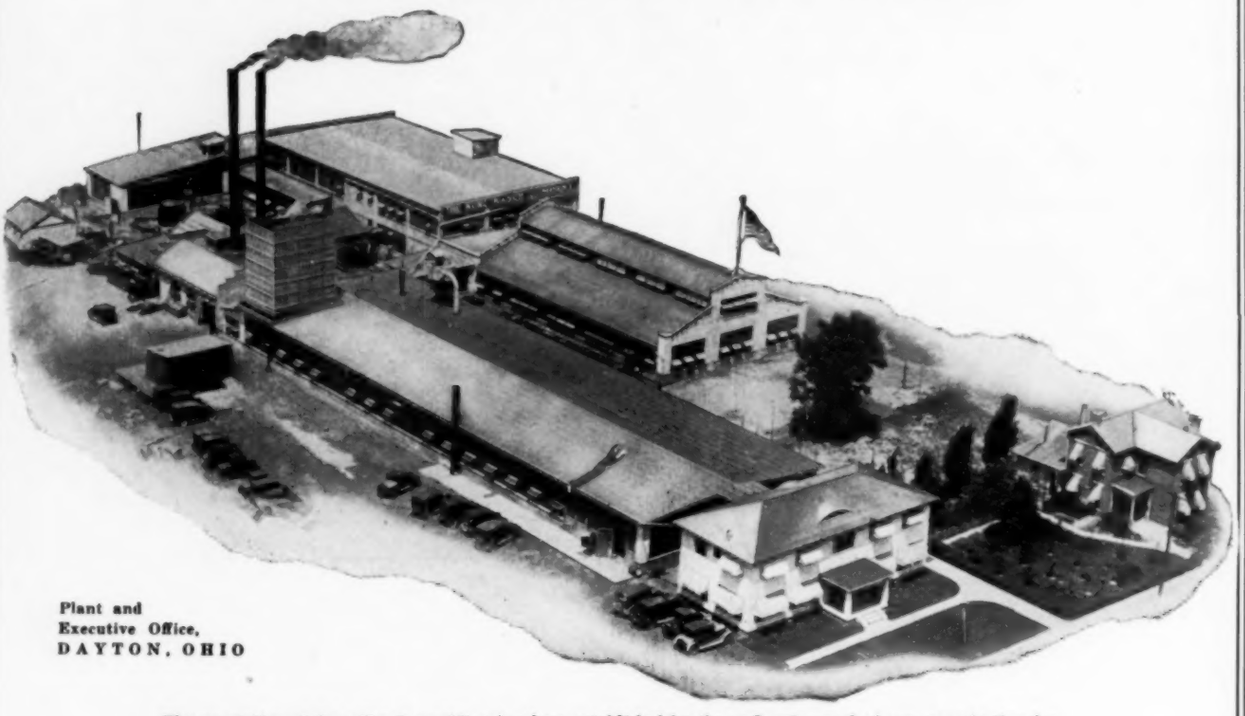
The product has an impression-taking face of metallic alloy of tin and lead and a moldable backing sheet formed of blotter board impregnated with condensation product such as Bakelite or Condensite in alcoholic solution. The method of using the product is substantially the same as that disclosed and claimed in Patent 1,357,344.

Plastic Moulding Headquarters

Specializing in moulding the new, light-colored materials Beetle and Lumarith

We are one of the four exclusive moulders selected by the Synthetic Plastics Co., an American Cynamid Co., subsidiary, equipped to mould their powder.

CUSTOM MOULDERS OF BAKELITE



Plant and
Executive Office,
DAYTON, OHIO

The reputation of Kurz-Kasch moulding has been established by the unflagging zeal of our organization for the finest results. The best materials, equipment and facilities are available, as well as ideal working conditions.

THE KURZ-KASCH CO.

Dayton, Ohio

MOULDERS OF PLASTICS

BAKELITE MOULDED

For Every Electrical Requirement

With our knowledge and moulding experience you may be assured that we can make the special piece exactly according to your specifications. We not only do the moulding but make the moulds. Every job is made under painstaking inspection.

Kuhn & Jacob Machine and Tool Co.

503 Prospect St. — **Trenton, N. J.**

New York Office
747 E. 10th St.
Brooklyn, N. Y.

Phila. Office
351 N. 57th St.

SERVING THE TERRITORY WEST OF THE ROCKIES

"ACCURACY FIRST"

HARRY W. HAHN Mfg. Co., Ltd.

629 S. San Pedro St., Los Angeles

Pacific Coast Plant
Doehler Die-Casting Co.
World's Largest Producers of Die-Castings

Custom Molding

Screw Machine Products

New Finnish Casein-molding Process

THE production of casein articles, such as bathroom fittings and accessories, lampshades, and so forth, is beginning to assume considerable importance at the present time in Europe. It is therefore of interest to note that a Finnish undertaking, Sarvis Osakeyhtio, of Tammerfors, has recently patented a process based on the fact that casein in a fresh state, before hardening, becomes elastic to a certain degree at a moderate temperature, and can then be formed into any desired shape by the application of pressure.

For this process an unhardened, half-dry sheet of casein, containing about 20 per cent of water, is placed between the appropriate mold section and its lid, and the lid is closed. Pressure then applied forms the material in the shape of the mold.

Plastics and Fountains

(*Continued from page 569*)

"We may live without friends;
We may live without books;
But civilized man cannot live
without cooks."

The poet's vision of a cook was that of his day and age, however—a culinary genius who relied upon his senses of taste and smell for his success. The cooks who supply the soda fountain trade are staffs of well trained food chemists, working in huge, laboratory-like kitchens and bakeries where food is prepared for the soda fountain trade according to scientific formulae. Romance is gone, also, from the serving. Breakfast toast and noonday sandwiches must be turned out with astonishing rapidity to supply the demands of throngs of hungry, busy people. Someday, an electrical Robot—with Bakelite insulation—may take orders for sandwiches and fill them with automatic accuracy.

The Place of the Molded Handle

One field of phenol resinoid application which has been increasing steadily during the

Let Us Put
Personality
Into Your
Molded Parts

—a personality that will be a real sales booster—one that adds a note of distinctiveness to the finished product.

Auburn Phenolic Compound Specialists are noted for their ability to produce in molded parts a richness and beauty that sets them apart from all others.

The parts can be made in the most delicate of colors to match and harmonize with any color scheme.

Perhaps the molded part should possess toughness, resiliency, or be heat resistant, immune to acids, non-warping, water-proof, etc., etc. No matter what the quality desired, it can be had in Auburn Molded Parts in just the degree best suited to your particular needs.

Our large facilities and modern methods permit prompt deliveries and reasonable prices.

Write for prices and actual samples of work we have produced

CELLULOID-BAKELITE DIVISION
Auburn
BUTTON WORKS *Inc.*
AUBURN, N.Y.

Semi-Automatic
80 Ton Bakelite Press

Moulding Presses

For all Plastic Materials

This cut shows one of ten presses with adjustable ejectors on both top and moving platens.

The high and low pressure operating valves are manipulated by an automatic electric valve control, without cams or shafting.

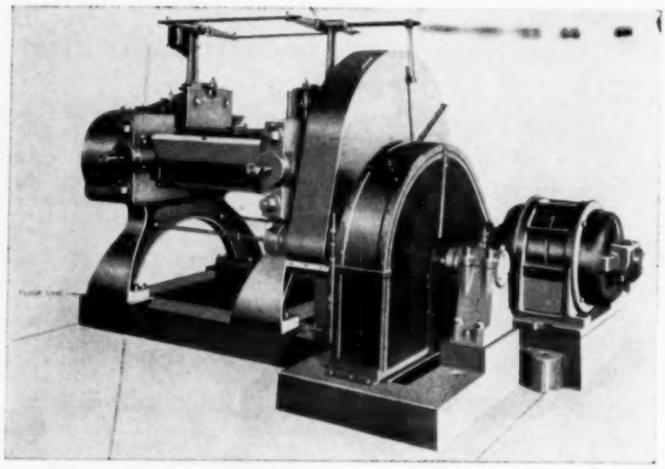
We manufacture hydraulic presses for all hot and cold moulding processes and also complete equipment including hydraulic accumulators, pumps, valves and piping.

Write for our pamphlet—
A new Automatic Control for Hydraulic Machinery.

R. D. WOOD & CO.

PHILADELPHIA, PA.

Established 1803 Works: Florence, N. J.



14x30 rolls for plastic mixing

Following carried in stock: 6 x 16—10 x 24—14 x 30—16 x 42. Specially designed for mixing Durez, Bakelite, Asphalts, and Shellac Compound materials.

The largest and oldest manufacturers are using our machines.

WM. R. THROPP & SONS CO.

Established 1888 Trenton, N. J.

Nixonoid

Rods
Sheeting
Tubes

•

HIGH standards are strictly maintained in all those qualities which have long made Nixonoid sheeting, rods and tubes the favorite wherever pyroxlyin plastic materials are used. Nixonoid solid colors, variegated mottlings and translucent and transparent stock are uniformly dependable when ordered time after time to match original samples.

LET us help you solve your pyroxylin fabricating problems by having our representative call, at your request, to demonstrate Nixonoid materials and service.

•

NIXON NITRATION WORKS

NIXON, NEW JERSEY

•

New York Office
320 FIFTH AVENUE
New York City

•

New England Representative
E. W. WIGGINS & CO., Inc.
Leominster, Mass.

past five years, and which has been developing since the earliest days of Bakelite materials, is that of handles. Percolator handles were early examples. The small coffee pots which one finds in hotels for the service of demi-tasse still have soggy, discolored, shaky, wooden handles. There is, in other words, a large field for resinoid replacement of wood in the utensil handle application which has long been conceived, but which requires more attention.

There is little question that for the average pot, pan, skillet, refrigerator, stove, etc., phenol resinoid molded handles are better than wood from the standpoint of ease of fabrication, mass production, durability, color, water-resistance, mechanical attachment, etc. Initial unit cost will undoubtedly be less for wood; eventual unit cost from the standpoint of durability and customer satisfaction may not be.

Orange juice extractor with Bakelite molded cup and fittings.

Many handles are made from metal which will be replaced by phenol resinoid. On the basis of mass production, the cost question can usually be settled satisfactorily, assuming sufficient production. The development of newer and better materials in the phenol resinoid group has made it possible to provide convincing answers to the questions of strength and heat resistance.

We specialize in MACHINES for CELLULOID, CATALIN and other PLASTIC MATERIALS

Bench Saw Tables
Shaping Machines
Jig Sawing Machines
Frazing & Engraving Machines
Rod Turning Machines for Beads, etc.

Hand Lever Presses
Gold Inlaying Machines
Electric Steam Heater Tables
Single & Multiple Spindle Drilling Machines
Vaporizing Machines

Dies — Tools — Molds — Special Machinery

#3 Drilling Machine with or without motor drive.

Full information sent on request.

STANDARD TOOL CO.

75 Water St.

LEOMINSTER MASS.

SOUTHWARK STANDARD and SPECIAL *HYDRAULIC* MOLDING PRESSES

Molding Press with Swing Table

A Press for every operation.

Specialists in the design of molding equipment to suit unusual operations.

BUILDERS OF
Hydraulic Presses for every use, Pumps Intensifiers, Valves, Fittings, etc.

Operate your presses with the HYLO Pumping Unit.

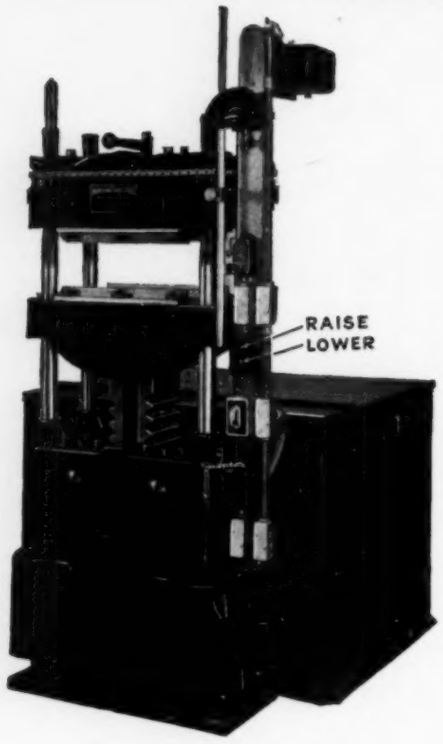
Bulletin 21

SOUTHWARK FOUNDRY and MACHINE CO.

Chicago Fisher Bldg. PHILADELPHIA, PA. Akron United Bldg.

YOU BUY MORE IN A TERKELSEN DEEP OR SHALLOW

Do It The ELECTRO-DRAULIC Way



TYPE E-I MODEL 50
WITH AUTOMATIC TIMING DEVICE

TERKELSEN PRESSES are the latest advancement in molding equipment. Each press is a complete self-contained molding unit in itself—strictly mechanical and not dependent on any expensive accessories such as pumps, accumulators, valves, high pressure pipe lines, etc.

AN INSTALLATION MEANS DEFINITE SAVINGS

Power Costs Reduced 10% to 60%
Maintenance Costs Reduced 40% to 80%
Production Increased 20% to 50%

TERKELSEN SEMI-AUTOMATIC
ELECTRO-DRAULICS
Will Do This For You

Write for Full Information.

TERKELSEN MACHINE COMPANY

Manufacturing Engineers

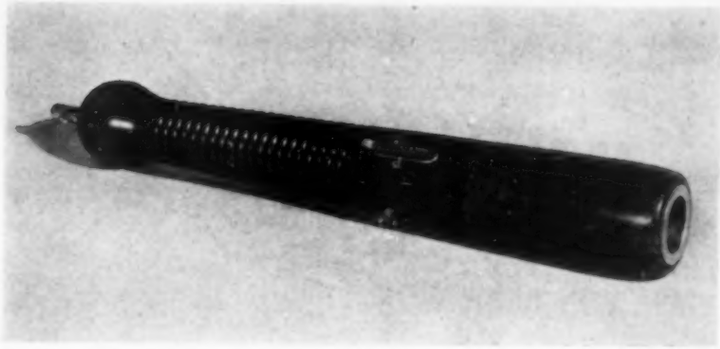
330 A STREET BOSTON, MASS., U. S. A.

British Representative: Francis Paisley, 76, Maryon Rd., London, S. E. 7

MACK MOLDING CO.

PRECISION MOLDERS OF PLASTIC MATERIALS

WAYNE NEW JERSEY



Travel Is Safe With The Bakelite Molded Tear Bomb Club

TRAVELING with Bakelite Resinoids wouldn't be a bad way to see the world and most of the romance, industry, and adventure therein. One would be "everywhere at once"—up in a skyscraper penthouse, down in the depth of a mine, soaring across oceans in airplanes, speeding across continents in crack express trains, listening with the wireless operator on board ship in a storm—and last, but not the least exciting, shoulder to shoulder with a sturdy officer of the law when he levels his "Gas Police Club" at a bandit. Of new and novel applications of Bakelite molding material there is no end, and this police club is not only new and novel; it is useful. For over twelve months it has been tried out in police departments and in prisons—and the officer always gets his man.

The club is molded in two sections. The upper end unscrews for the insertion of a twelve gauge gas shell. There is no danger of the gas shell going off without warning as it is released only by pulling the folding trigger. The ideal feature of this club, is that the officer has a double weapon. He can fight two battles at once. At close range, the club can be used in the usual manner to induce docility in a prisoner. At long range—should a reinforcement of bandits arrive to rescue their unfortunate buddy from the strong arm of the law—the officer, without changing his grip on the club, pulls open a trigger and fires a charge of gas at the attacking party. Seriously speaking, the handle end of this club would be the only desirable place to locate.

The mechanism and method of manufacture are patented by R. F. Sedgley, Inc. This company reports that the clubs have now been in service for over a year, and "have stood up extremely well."

Lumarith Technical Book

THE first authoritative booklet on the physical and chemical characteristics of cellulose acetate (Lumarith) molding materials is now being distributed.

This booklet not only contains valuable information on the characteristics of Lumarith but also is a technical guide for molding equipment and procedure for the molding of Lumarith.

A copy of this valuable booklet may be secured from Lumarith Division of Celluloid Corporation, 10 East 40th Street, New York, N. Y.

Impregnating Metal Castings With Durez Varnish

WITH certain ferrous and non-ferrous castings it is advisable to overcome their natural porosity to avoid corrosion.

The application of a special grade of Durez Varnish has been successfully applied to a diversified field. The Automotive, Radiation, Electrical and Compressor manufacturers and makers of castings in other lines use General Plastics' method of Durez treatment.

The method of application is carried out in various ways, depending upon the type of box and the result desired. The general practice is to impregnate the pieces under pressure; sometimes after vacuum treatment, perhaps heated for slight expansion, then drained, air dried, and baked. The baking temperature is comparatively low, 250 to 300 degrees F. for a sufficient period to heat the cast part through. Should the applications be made to an exterior surface it may be sand blasted, or wire brushed to expose the original metal.

This treatment with Durez number 278 retards corrosion from sea-water, dilute alkalies, acids and ammonia, also certain anti-freezes. It prevents the seepage of oil, the leakage of compressed air, or liquids under pressure.

The quantity of Durez number 278 (product of General Plastics, Inc., North Tonawanda, New York) used to a pound of metal is necessarily small, hence the material cost is slight for the benefits derived.

New Molding Organization Set Up on West Coast

R. B. STRINGFIELD and Martin Oedekerk have left the Golden State Rubber Mills to establish the firm of Stringfield and Oedekerk, and will engage in the custom molding of Bakelite and building of molds at 762 E. Slauson Ave., Los Angeles. Mr. Stringfield has had wide experience in chemical engineering lines as former Chief Chemist for the Butte and Superior Mining Co., and the Goodyear Tire and Rubber Co. of Cal., and as consultant for several organizations. Mr. Oedekerk has had long experience in machine design and die construction with the Studebaker Corp., and elsewhere, and is well known on the Pacific Coast.

OUR MOULDED PRODUCTS BEARING THESE TRADE MARKS *Stand For*

QUALITY
DEPENDABILITY
ACCURACY
AND SERVICE

ELECTROSE

The design and construction of moulds, as well as the art of moulding, requires highly specialized skill in producing the finished article.

Insulation Manufacturing Co. has this skill which has been proved by over thirty-five years of custom moulding to the trades.

B

DUREZ

THERMO PLASTIC COMPOUND MAKALOT TRADE MARK SYMBOLIZES GREATER PRODUCTION

When you are in the market for moulded articles, we would like to receive your inquiries, which will have our prompt attention.

INSULATION MFG. CO., INC.
GENERAL INSULATE CO., INC.
New York Ave. & Herkimer Street
Brooklyn, N. Y.

CELLULOSE ACETATE
SODIUM ACETATE
TRIPHENYL PHOSPHATE
DIBUTYL PHTHALATE
DIETHYL PHTHALATE
ACETIC ANHYDRIDE
CRESYLIC ACID

CASEIN— For All Purposes

American-British Chemical Supplies, Inc.
180 Madison Avenue
New York N. Y.
Ashland 2265

TRADE MARK BB REG. U.S. PAT. OFF.

Pioneer Molders
of
Phenolic Products

Specialists in the Design and Execution of Precision Work

BB

Your Guarantee of Service

Boonton Rubber Manufacturing Company

▲ ▲ ▲

Boonton, N. J.

Booklet on Furfural

"FURFURAL and its Use in Industry" is the title of a booklet being mailed by the Miner Laboratories, the only distributors of this chemical raw material that has had such a tremendous industrial growth in the past decade. The booklet describes how furfural is used in synthetic resin manufacture and as a solvent in various processes, as well as properties and uses of the furfural derivatives.

New Durez Color

GENERAL Plastics announces Magenta. For the unacquainted, this is a very deep rose—almost a maroon. It molds well and the color is rich and permanent.

Index to Patents in the Aladin Review

(*Continued from page 582*)

Swiss Patents

Patent No.	Serial No.	Patent No.	Serial No.
103222	209	122939	369
103655	360	122993	38
105657	361	123045	212
108465	362	123163	447
111790	363	123274	39
113739	210	123515	268
116160	37	123689	370
116591	104	124141	371
117170	364	124533	140
117361	365	124635	387
118005	485	125010	372
118725	366	125011	377
119461	211	125012	495
120532	130	125369	269
120533	131	125370	270
120811	367	125485	271
121245	409	125725	388
121246	410	125729	272
121247	411	126457	213
121817	232	126827	373
122362	499	127039	214
122601	368	127274	389

Austrian Patents

Patent No.	Serial No.	Patent No.	Serial No.
95718	463	105809	356
95719	464	106018	32
98545	351	106210	386
99425	352	106329	33
99906	353	107155	357
100049	113	107427	358
101293	354	107429	359
101628	76	107842	129
103910	355	108108	34
104707	114	108159	206
104724	115	108680	207
105352	31	109532	376
105788	469	109678	77

Swedish Patents

Patent No.	Serial No.	Patent No.	Serial No.
57494	35	58935	36
58116	139	60733	208

GUMMON
COLD MOLDING

Research
+
Engineering
Service
+
Expert
Craftsmanship

Press Room
of the

GARFIELD MANUFACTURING COMPANY
Garfield, New Jersey

EXPERIENCE
ORGANIZATION
EQUIPMENT
FINANCIAL RESPONSIBILITY

Combine to make us a **MOST RELIABLE** source of supply
For Molded Parts

BAKELITE
DUREZ
BEETLE
LUMARITH

Custom Molders Since 1908

Northern Industrial Chemical Co.
11 ELKINS ST. **SO. BOSTON, MASS.**

DM

DIEMOLDING CORPORATION

Molding Service for Plastic Materials

BAKELITE - BEETLE - DUREZ

CANASTOTA, NEW YORK

Danish Patent

Patent No.	Serial No.
35423	— 16

Issues and Pages in PLASTICS wherein each set of numbers appeared

1-30, May 1929, p. 258; 31-61, June 1929, p. 326; 62-87, Aug. 1929, p. 449; 88-118, Sept. 1929, p. 507; 119-168, Nov. 1929, p. 627; 169-214, Dec. 1929, p. 686; 215-239, Jan. 1930, p. 14; 240-267, Feb. 1930, p. 82; 268 289, March 1930, p. 147; 290-340, May 1930, p. 262; 341-389, July 1930, p. 386; 390-441, Aug. 1930, p. 443; 442-469, Sept. 1930, p. 505; 469-498, Oct. 1930, p. 577.

Formation of Synthetic Resins

(*Continued from page 574*)

A second application of these postulates is found in the development of permanently flexible alkyd resins. It was known, according to Postulate 2, that (2,2) reactions resulted in chain molecules. Furthermore, if both reacting molecules were long as compared with their cross sections, and if the reactive groups were on the ends, flexibility could be expected. Therefore, it was reasoned that glycol and a dibasic acid—e. g., succinic acid—if added to the glycerol-phthalic anhydride reacting mixture, should enter into the molecular bonding and induce flexibility. Such resins should be heat-convertible and their flexibility should vary according to the mol ratio between the glycol-dibasic acid ester and the glyceryl phthalate. When these resins were prepared, such properties were obtained. By the proper adjustment of the mol ratio, a permanently flexible, heat-convertible resin has been made approaching the flexibility of rubber.

Conclusion

The postulates that have been developed lead us to a chemical explanation of the formation and properties of synthetic resins and other high polymers. This explanation appears to be broadly substantiated. Further knowledge may warrant its future modification. It has been presented, however, with the belief that it furnishes a better conception of facts in a field full of complexities.

SPEED UP Your Molding IMPROVE Your Product With

CAMBRIDGE Mold Pyrometer

In plants where Cambridge Mold Pyrometers are in constant use, a high standard of production is regularly maintained, there are few spoilages and the daily output is increased.

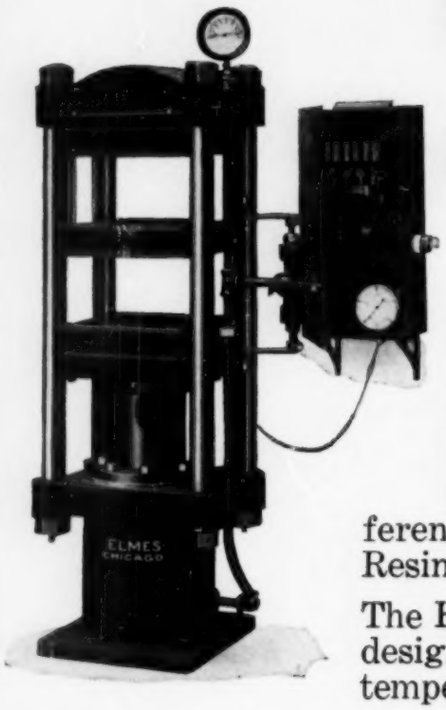
Interior or exterior surface temperatures of molds are KNOWN —not guessed at—when the Cambridge Mold Pyrometer is used. Application of this instrument is so simple that any operator can use it. Temperatures are accurately and quickly read from the open scale. The Mold Type is furnished with range of 50-400° F.

Fully described in list 194-S.

CAMBRIDGE
INSTRUMENT CO INC

Pioneer Makers of Precision Instruments

3512 Grand Central Terminal
New York



Molding Platens Electrically Heated

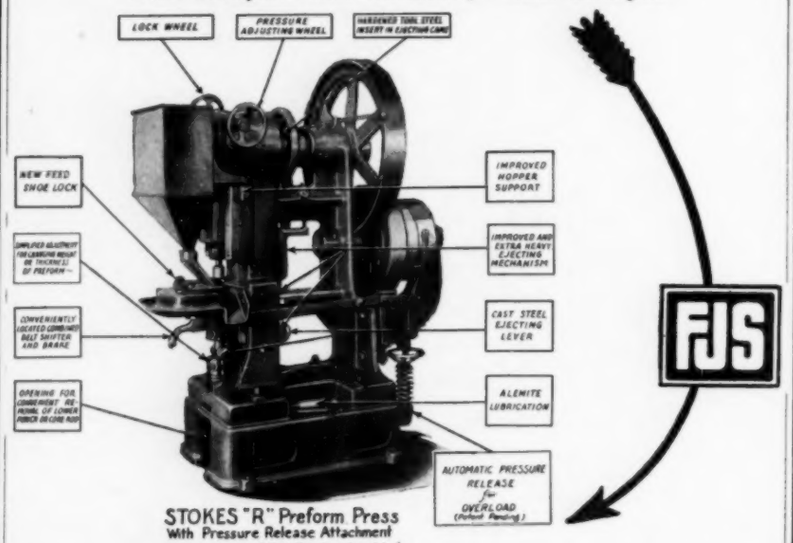
These platens have renewable ground surfaces and the temperature may be varied for molding different kinds of Plastic Resinous Compounds.

The Heating Element is designed to have a low temperature gradient.

THE CHARLES F. ELMES HYDRAULIC MACHINERY ENGINEERING WORKS
1002 Fulton St., Chicago, U. S. A.

Now You Can't Smash Your Preform Press

The twelfth New Feature,—best one yet



STOKES "R" Preform Press
With Pressure Release Attachment
(also arranged for direct motor drive)

STOKES Automatic Pressure Release (patents pending) spills overloads and absorbs strains in preforming presses. Prevents jams and breakdowns. More than insurance, it's a necessity for uninterrupted production. Write for details today.

This essential attachment is also on all STOKES Rotary Preform Presses for production work.

FJS STOKES MACHINE COMPANY

5934 Tabor Road — Process Machinery since 1895 Philadelphia, Pa. — Olney P. O.

MARBLETTE

The New Phenolic Material

Odorless—tasteless — non-inflammable — impervious to alcohol, water, oils and common acids — dielectric strength between glass and mica — tensile strength 8,000 lbs. per sq. inch — compressive yield point 10,000 lbs. per sq. inch — specific gravity 1.29.

A cast synthetic resin that runs through the whole range of colors, in plain or marbled effects, from transparent aquamarine to the deepest jade. Also a snow white. Unexcelled for shaving brush and umbrella handles, dice, jewelry, etc.

We also make a transparent material for hydrofluoric acid containers and all types of laboratory equipment.

Tubes, Rods, Blocks
Special Castings
(Delivery App. 10 days)

THE MARBLETTE CORPORATION

37-18 31st Street
LONG ISLAND CITY,
NEW YORK

Acknowledgment

Acknowledgment is made of the assistance given by A. G. Hovey and P. F. Schlingman with the experimental work, and by E. H. Winslow with the manuscript.

Literature Cited

(1) Auer, *Kolloid-Z.*, **42**, 288 (1927).

(2) Baekeland and Bender, Ind. Eng. Chem., **17**, 225 (1925).

(3) Barry, Drummond, and Morrell, "Natural and Synthetic Resins," Van Nostrand.

(4) Carothers, *J. Am. Chem. Soc.*, **51**, 2548 (1929).

(5) Carothers and Dorough, *Ibid.*, **52**, 711 (1930).

(6) Carothers and van Natta, *Ibid.*, **52**, 314 (1929).

(7) Clark, "X-Rays and Crystal Structure," p. 185, McGraw-Hill.

(8) Ellis, "Synthetic Resins and Their Plastics," Chemical Catalog.

(9) Fonrobert and Pollauf, *Chem. Umschau*, **33**, 41 (1926).

(10) Hauser, Ind. Eng. Chem., **21**, 124 (1929).

(11) Hengstenberg, *Ann. Physik*, **84**, 245 (1928).

(12) Herzog and Kreidl, *Oesterr. Chem.-Ztg.*, **24**, 76 (1921); *Z. angew. Chem.*, **35**, 465, 641 (1922).

(13) Hovey, Unpublished Thesis for M.Sc. degree, Union College, 1928.

(14) Kienle and Ferguson, Ind. Eng. Chem., **21**, 349 (1929).

(15) Kienle and Hovey, *J. Am. Chem. Soc.*, **51**, 509 (1929).

(16) Krumbhaar, *Chem.-Ztg.*, **40**, 937 (1916).

(17) Mark and Meyer, *Ber.*, **61**, 539 (1928).

(18) Novak and Cech., Ind. Eng. Chem., **20**, 796 (1928).

(19) Ostwald, Handbook of Colloid Chemistry, Blakiston.

(20) Ott, *Helv. Chim. Acta*, **11**, 300 (1928).

(21) Scheiber, *Z. angew. Chem.*, **40**, 1279 (1927).

(22) Scheiber and Sändig, "Die künstlichen Harze," Wissenschaftliche Verlagsgesellschaft, Stuttgart.

(23) Staudinger, *Ber.*, **59**, 3019 (1926).

(24) Staudinger, *Ibid.*, **62**, 2893 (1929).

(25) Whitby and Katz, *J. Am. Chem. Soc.*, **50**, 1160 (1928).

(26) Whitby, McNally, and Gallay, *Trans. Roy. Soc. Can.*, **22**, 27 (1928).

(27) Wolff, *Farben-Ztg.*, **32**, 22 (1926).

Check These Norloc Features

		Norton Answer	Any Other Molder
1	Has Norton the ability to furnish molded parts in sufficient volume for our requirements, whether one hundred or one million?	YES	
2	Has the Norton Company an adequate engineering force to properly design molded products for our needs?	YES	
3	Has Norton an up to date cost system so they are able to accurately figure costs?	YES	
4	Can Norton render prompt service?	YES	
5	Has Norton the necessary experience to handle our molding problems?	YES	
✓	Is Norton a responsible concern, backed by adequate capital so there are no risks involved in dealing with them?	YES	

PLEASE check what we consider a fair list of questions as above, and convince yourself that Norton is capable of handling your molding requirements. Surely you want to do business with a responsible concern. Norton can fulfill that requirement. You want adequate experience. Norton has had it in their service to the best names found in the Blue Book of American Business.

Your molding problems will find prompt and careful attention at the hands of Norton. Why not consider them for your next requirements?

Norloc

Norton Laboratories, Inc.
LOCKPORT, N. Y.

ROCHESTER, N. Y., O. P. Guthrie, 423 Powers Bldg.
CHICAGO, ILL., Mr. W. M. Craig, 228 North La Salle St.
DETROIT, MICH., W. H. Mark Hanna, 6-247 General Motors Bldg.
BRIDGEPORT, CONN., Mr. J. S. Berthold, 1115 Main St.
HILLSIDE, N. J., Mr. A. C. Hall, 1262 Miriam Place

Custom Moulders of Bakelite, Durez and other Resinous Plastics

Technical Abstract Section

A Concise Review of Patents and Literature

Composition Containing Chlor Rubber. Carleton Ellis, assignor to Chadeloid Chemical Company. U. S. P. 1,750,583; Mar. 11, 1930.

A. Chlor rubber 10 parts by weight, toluol 25 parts, triphenyl phosphate 4 parts.

B. Chlor rubber 10 parts, toluol 25 parts, diethyl phthalate 2 parts, triphenyl phosphate 1 part.

C. Chlor rubber 10 parts, carbon bisulphide 25 parts, diethyl phthalate 1 part, triphenyl phosphate 2 parts.

D. Chlor rubber 10 parts, toluol 25 parts, diethyl phthalate 2 parts, camphor 2 parts.

E. Chlor rubber 9 parts, benzol 24 parts, camphor 1 part, diethyl phthalate 2 parts, pentachlorethane ½ part.

F. Chlor rubber 14 parts, benzol 20 parts, toluol 20 parts, camphor and diethyl phthalate each 1 part.

G. Chlor rubber 10 parts, benzol 50 parts, camphor and diethyl phthalate each 1½ parts.

Waterproof Fire-resistant Plastic Composition. Charles R. Faben, assignor to The American Tar Products Company, of Chicago, Ill. U. S. P. 1,751,690; Mar. 25, 1930.

The process of producing a waterproof, fire resistant plastic composition, which consists in mixing 500 parts by weight of inert mineral filler with 333 parts by weight of powdered pitch and 100 parts by weight of fibrous binder, and adding to the mixture 600 parts by weight of water which is worked into the mixture to form a paste containing an emulsion of such inert material and water, next adding to the mixture 150 parts by weight of coal tar and allowing the water to evaporate from the mixture; substantially as specified.

Rubber Derivative and Method of Making Same. Webster N. Jones and Herbert A. Winkelmann, of Akron, O., assignors to the B. F. Goodrich Company. U. S. P. 1,751,817; Mar. 25, 1930.

This invention relates to methods of producing thermoplastic derivatives of rubber by treating rubber with certain salts of amphoteric metals capable of reacting therewith, and to the products of such reaction.

An object of this invention is to provide derivatives of rubber having changed physical and chemical properties, particularly a higher degree of heat plasticity and a less chemical unsaturation than the rubber, from which the derivatives are made, and further to provide a process of manufacture which shall economically produce derivatives of rubber having these changed properties.

It has been found that certain salts of amphoteric metals react with rubber, when intimate mixtures thereof are heated to moderately high temperature, to form materials which are heat plastic at relatively low temperatures. Generally, the halides of amphoteric metals, the fluorides excepted, can be made to bring about these changes in rubber, the following salts having been found to be particularly adapted for reaction with rubber to give heat plastic products: aluminum chloride, aluminum bromide, aluminum iodide, antimony chloride, antimony bromide, antimony iodide, bismuth chloride, chromium bromide, ferric chloride, ferric bromide, ferrous bromide, ferrous iodide, manganese iodide, stannous chloride, stannic iodide, vanadium chloride, zirconium chloride, zinc chloride, zinc bromide, and zinc iodide.

As an example of the preparation of a thermoplastic product by the use of the above named salts, take 10 parts by weight of ferric chloride and intimately disperse it through 100 parts by weight of crude rubber, preferably by milling the reagent into the rubber, as on a rubber mill, and subject the mass to dry-heat at 160° C. for 15 hours. A strong exothermal reaction takes place between the salt and the rubber, the temperature of the mix rising to 200-250° C. The resulting product is a hard, brittle heat-plastic material having a relatively low softening temperature. It is black in color, breaks with a conchoidal fracture and is chemically less unsaturated than the rubber from which it is prepared.

Stencil Sheet. Alex Brooking Davis, of Cincinnati, O., assignor to A. B. Dick Company, of Chicago. U. S. P. 1,763,955; June 17, 1930.

A stencil sheet of the character described, comprising base material having a type impressible cellulose compound coating including polyhydric alcohol ununiformly esterified by means of acetic acid and propionic acid.

A stencil sheet of the character described, comprising base material having a type impressible cellulose compound coating including glycerol ununiformly esterified by means of anhydrous acetic acid and propionic acid.

Production of Cellulose Ester Compounds. Alonzo S. McDaniel, of New York, N. Y., assignor to Cellulose Utilities Corporation. U. S. P. 1,759,489; May 20, 1930.

In the method of dissolving a cellulose ester, the step which comprises bringing the cellulose ester into intimate contact with an uncombined volatile amino base derivative and subsequently neutralizing the amino derivative by means of an excess of hydrochloric acid, and then volatilizing the excess hydrochloric acid.

In the method of dissolving a cellulose ester, the step which comprises bringing the cellulose ester while in the porous, substantially solid, state, into intimate contact with the vapors of uncombined monomethylamine, and subsequently subjecting the cellulose ester to the action of a relatively small proportion of an organic solvent and stirring the cellulose ester and solvent until the mixture or solution of cellulose ester and solvent aquires the desired consistentcy and flowing properties.

Method of Making Composition Blanks William J. Gaven, of Wilkes-Barre, Pennsylvania, and Michael Fried, of Mount Vernon, New York. U. S. P. 1,765,719; June 24, 1930.

1 pound of terra alba;
1 pound of china clay,
1 pound of wood pulp
8 pounds of coal dust or culm
10 pounds of resinous binder with suitable coloring matter.

The herein-described method for molding composite plastic and non-plastic articles, which consists in assembling upon a non-plastic base, a coating of unrolled, dry, mixed, powdered, raw ingredients involving a resinous binder in its virgin state, with a central depression in the material whereby the material will be forced to move radially to secure an equal distribution when heated, subjecting said base with the composition ingredients thereon to a single heating for a period of from one to two minutes at a temperature of from 300 to 400° F. whereby the several ingredients are united with each other in a coherent plastic mass and simultaneously permanently fixed to said non-plastic base.

Rubber-Like Substance From Cashew-Nut-Shell Oil. Mortimer T. Harvey, of New York N. Y., assignor to The Harvel Corporation. U. S. P. 1,771,785; July 29, 1930.

Reaction product of glycerine and cashew nut shell oil.

Reaction product of glycerine and cashew nut shell oil in the respective proportions of two parts to five parts by volume, substantially.

The method of producing a composition of matter which comprises heating glycerine with cashew nut shell oil at a temperature beginning at about 240° C., and higher as the reaction progresses.

The method of producing a composition of matter which comprises heating glycerine and cashew nut shell oil at a temperature ranging upwardly from about 240° C.

Method of Making Synthetic Resins. Emil E. Novotny, of Philadelphia, Pennsylvania, assignor to John Stogdell Stokes, of Spring Valley Farms, Penna. U. S. P. 1,771,508; July 29, 1930.

Example 1

Place in a suitable enclosed still or digester provided with a condenser or condensers for refluxing and distillation and provided with suitable stirring device, material inlets and outlets, etc., and preferably heated by means of a steam jacket, said steam jacket likewise being provided with a cold water inlet and outlet for cooling. Put in this receptacle the following raw materials:

Xylenol, commercial grade preferably	2600
Furfural	1300
Formalin (ordinary 37 to 40% formaldehyde solution)	1240

The above quantities are given as parts by weight.

Boil under the reflux condenser for from one to two hours or until a proper preliminary viscosity has been obtained, then distil off until a total of about 987 parts by weight consisting primarily of water of solution and synthetic water of reaction have been removed. After the distillation has been completed place condenser in reflux position or use condenser provided for this purpose, and boil for from three to six hours or until the proper final viscosity has been obtained. The product is now in condition for use, and is a low melting point sludge or varnish or lacquer base and may readily be cut with a suitable solvent such as alcohol, acetone, furfural or a mixture of solvents. In this example I shall add 1400 parts by weight of ordinary denatured alcohol. The material is now discharged into suitable drums and is ready for use.

Example 2

Cresol, commercial grade	2600
Furfural	1300
Formaldehyde	1240
Potassium carbonate	13

Place materials into a suitable digester provided with a condenser for refluxing and distillation, also provided with suitable stirring apparatus and preferably jacketed for heating and cooling. Boil under reflux condenser for from one to two hours and then distil off approximately 19% of the total kettle output or approximately 1017 parts as given above. The distillation is continued until a maximum temperature of 244° F. has been reached. Arrange condenser for refluxing and bring to a boil and maintain boiling with a temperature of the contents of the digester at from 230° to 240° F. This boiling is maintained for a period of from 1½ to 2½ hours. At this point, if a varnish is desired, about 145 parts of alcohol may be introduced into the hot contents of the kettle and the product may thereupon be emptied into suitable drums. Upon analysis the varnish will contain about 75% resin solids. If a harder variety of resin is desired the boil-

A Real Preforming Press

"STANDARD"

SPECIFICATIONS:
Max. Capacity—4" diameter, 2" depth of cell
Speed—50 strokes per minute.
Pressure—80 tons Wt.—12,000 lbs. H.P.—10
Larger sizes built on specifications

DESIGNED ESPECIALLY
for
PREFORMING
MOULDING
POWDERS

FEATURES:

Makes preforms hard as desired, 1/8" or 1" thick. Multiple cavities up to single maximum cavity of 4" diameter. Same density, same hardness.

Toggle operated with hydraulic compensating relief valve, safety collar drive.

Guaranteed continual operation.

THE STANDARD MACHINERY CO.
MYSTIC, CONN.

Monsanto Chemicals

PHENOL U.S.P.

Pure Monsanto Phenol is especially adapted for use in synthetic resins. Prompt shipments in tank cars or appropriate small containers.

Other Monsanto Chemicals include
PHTHALIC ANHYDRIDE—MALEIC ACID—ALTAI (TRIPHENYL PHOSPHATE)—PLASTICIZERS

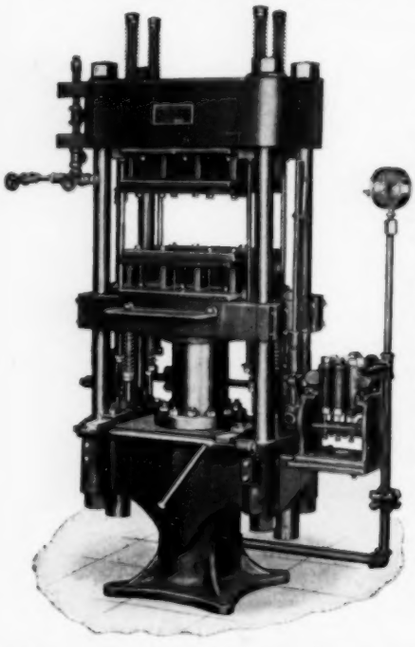
Monsanto Chemical Works
ST. LOUIS, U.S.A.

District Offices at

10 East 40th St. NEW YORK
500 No. Dearborn CHICAGO
375 Brannan St. SAN FRANCISCO

CHEMICALS = QUALITY Monsanto ST LOUIS, U.S.A.

Semi-Automatic Molding Press



HOT OR COLD MOLDING

Synthetic Resins and other Plastics, molded in Dies, or in Flat or laminated Sheets. Four sizes, 75, 117, 168 and 265 tons pressure. Will take molds up to 18"x 30" for the larger size. Adjustable ejector bars on both head and platen; and quick drop attachment for lower ejectors. Pull-back Cylinders, Copper Coil Steam Fittings, Operating Valves and Pressure Gauge. Also Plain Hot and Chilling Presses, Accumulators, Pumps, etc.

Presses for Special Work Made to Order.

Our experience of more than fifty years is at your service.

Established 1872.

Dunning & Boschert Press Company, Inc.
No. 330 West Water St. SYRACUSE, N. Y.

ing may be continued for a longer length of time until a resin having the desired melting point has been obtained.

Isolation of Benzylcellulose. Eduard Dörr, of Elberfeld, German, assignor to I. G. Farbenindustrie A.-G. U. S. P. 1,771,529; July 29, 1930.

Example 1.—1 kilogram of crude benzyl cellulose is well mixed with common salt (i. e., a commercial grade of sodium chloride,) in amounts either equal or double by weight (or more or less) and then extracted with benzine in an extraction apparatus until the outflowing extraction liquid no longer contains any benzyl alcohol or benzyl ether. Thereupon the salt content of the mass is removed by washing with water.

Example 2.—1 kilogram of crude benzyl cellulose is malaxated with common salt in amounts either equal or double by weight (or more or less). When the mass has assumed a uniform consistency, 1 litre of alcohol is added and the kneading is continued for about ¼-½ an hour, when the liquid is run off. If necessary, the mass is extracted a second time with 1 litre of alcohol, after which the salt content is completely washed out with water and the final residues of benzyl alcohol and benzyl ether are then removed from the flocculent product with spirits.

The process can also be varied by alternately working with different solvents, for example first with benzine, then with ethyl alcohol or acetone, and lastly with water.

Cellulose Ester Composition. James F. Walsh, Harry E. Smith, and Amerigo F. Caprio assignors to Celluloid Corporation. U. S. P. 1,772,529; Aug. 12, 1930.

1. A solid plastic composition consisting substantially of one hundred parts pyroxylin, twenty parts camphor and ten parts dibutylphthalate.

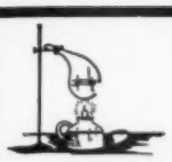
2. The process of making a pyroxylin compound comprising a composition of pyroxylin, camphor and a simple alkyl ester of phthalate acid where the alkyl radicals contain less than six carbon atoms, which consists in mixing ten parts dibutyl phthalate with one hundred parts hydrous pyroxylin, dry basis, and afterwards removing the water therefrom, and then adding twenty parts camphor dissolved with solvents.

Battery Seal Composition. Lauchlin M. Currie of Lakewood, Ohio, assignor to National Carbon Co., Inc. U. S. P. 1771,775; July 29, 1930.

1. A sealing composition containing up to about 1% lime, up to about 3% Chinese wood oil and glycerine, up to 4% coloring matter, with the balance consisting of about equal parts of rosin and mineral filler.

2. A battery seal composition consisting principally of rosin and a mineral filler and including up to about 4% of a drying oil and lime.

3. A battery seal composition containing up to about 1% lime, up to about 3% of a drying oil and glycerine, up to 4% coloring matter, with the balance consisting of about equal parts of rosin and mineral filler.



Materials
for the Plastics Industries

COTTON FLOCKS of SUPERIOR QUALITY

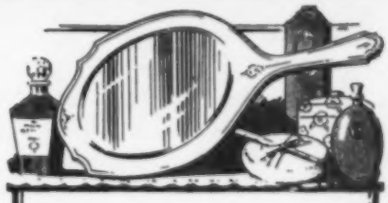
We are suppliers to all the leaders in the Plastic Molding Industry.

THEY KNOW QUALITY!

Write for samples and quotations

Claremont Waste Mfg Co.

CLAREMONT, N. H.



Good Mirrors will guarantee approval of your Product

Standard Mirror Co

151 - 157 HARRISON STREET

Buffalo

MANUFACTURERS

Do you make or use celluloid items?

Let us quote you on your Pyroxylin parts or your finished item.

Writing us may be quite worth while.

C. J. Bates & Son

CHESTER, CONN.

Your Back Copies of Plastics and Molded Products *Are Worth Money*

We will buy January, February, March and April, 1930, and all copies of 1925 that you may have duplicated or no longer require. Send us a list and we will give you our prices for your lot.

Reply to Desk B

PLASTIC PUBLICATIONS, Inc.

114 East 32nd Street New York City

And Now, In Closing:

THE revival of Backgammon should revive other games . . . which in turn should revive sales of rods, blocks and even tubes . . . Speaking of sales, most of the molders have ceased to kick about them . . . or rather about the lack of them . . . now the kick is profit, which isn't an innovation. . . . But business, believe it or not, is much better. . . . Very few salaries were cut during the slump . . . and, in some quarters, this was the reason for slumping. . . . Lowered prices don't always mean market expansion . . . sometimes they cause quality extermination. . . . According to reports, somebody must have a lot of "seconds". . . . Maybe they are thirds . . . or tenths. . . . Beetle advertises their cups in color in the *New Yorker* . . . and if you want to see what they look like, turn to page 609 (adv.) . . . We were right on the new preforming machinery (also adv.) . . . . . . The molders meet next at Old Point Comfort . . . accent on the last word. . .

THIS issue is the sixth birthday of the publication. In October, 1925 PLASTICS was published, and the Section—MOLDED PRODUCTS — was not added until May, 1927. It is a sterling tribute to the progress of the molding industry that we now change our title to the combined and broader one of PLASTICS & MOLDED PRODUCTS. This change is necessary for the advancement of the paper in its work for the industry, but it is gratifying to have this happen on its birthday, when it can salute its readers with a new form of balance, layout and contents. The authoritative technical articles will continue, but in this day the need of the plastic industry is for markets, distribution and method and we must take steps to fulfill the need.

In order to work in closer concord with the molder, to know and appreciate his problems and plans, five outstanding executives in this branch of the industry have agreed to co-operate with us in tuning editorial appeal to the exacting demands of suppliers, customers and the molders themselves. These five will meet with our staff at least once every quarter, and twice a year with our Advisory Board. It is with a great deal of pleasure that we introduce R. A. Allen, J. G. Rossiter, J. B. Neal, F. H. Shaw and L. F. Stratton, whose biographical sketches appear earlier in the issue.

WE also announce at this time an editorial feature, —a series of "Thumb-Nail Sketches"—, which will cover the lives, achievements and habits (if any) of men in all branches of the Industry. It is our belief that the careers, not only of prominent men, but of lesser-known workers in plants, laboratories and in the field will have permanent value. Not a mere record, but something more human and distinctly personal, and a sure index to the achievements of our times.

VISITING the current Radio World's Fair is somewhat like going to Coney Island. Full fledged hawkers, with trick pencils, ice cream and assorted gadgets; girls in gaudy—and scanty—costumes poised on top of mahogany cabinets; little boys playing tag, expensive booklets and sales literature clutched in one hand; Mr. and Mrs. Public watching their children at auditions; phonograph records, publications and the New York World giving away chances on a radio. Mostly this is a furniture exhibit, with a lot of noise and cigarette smoke. No wonder Bakelite, Scranton Button—Pardon us; American Record—are not exhibiting this year.

IT can be stated most definitely that business is good. This is not based on the opinions of our editorial brothers now in session at Washington, nor is it based on personal optimism. We have listened to the croaker for too long a time, and we are getting disgusted. There is plenty of business, at good prices, and while the competition is keener than usual there is every reason to feel encouraged. 1931, barring accidents, should be a banner year, and November and December will be the largest months of 1930. Employment is better and prices are fairer. On the other hand this is not the time to sit back, even for those out of the red; there is much too strong a bid for the dollar to-day, and there are too many who have to recoup grave losses. This is the time to quote Emerson: "I look on that man as happy who, when there is a question of success, looks into his work for a reply; not into the market, not into opinion, but into patronage".

SO we have a fine party. We feel more than confident that our "new" publication will meet with universal approval. If it renders better service, solves more problems, gives more satisfaction and wider interest it will have done its job —so far—with credit.